

COAL AGE

Volume 15

New York, March 27, 1919

Number 13

Removing the Causes of Trouble

BY FLOYD W. PARSONS



LABOR unrest is not a new disease; it is as old as humanity. But the present epidemic is more virulent and more widespread than ever before, and the pity of it is that back of all the trouble are real causes. If certain capitalists and industrial leaders had not exploited labor in the past, there would be no such upheavals as occur today.

It is human nature to condemn a whole class because several members are unjust. A dozen dishonest employers can throw an industry into bad repute. The same truth applies to labor organizations. The wonder is that in the light of this common fact real citizens should fail to expel from their councils and associations those who perpetrate wrongs and foster discontent. Whether the man be employer or employee, there should be no place in the business community for him if his life holds no thought of the full responsibility he owes his fellow citizens.

Health is the precursor of happiness. It is often the index of a man's worth to his company. Individual efficiency is determined by endurance of body and clearness of mind. An emergency often arises and prompt action is necessary. Sickness and indecision are twin brothers.

There are several great corporations in America that through all the turmoil of recent years have never had a strike. The managements recognize that labor unrest is due, not only to wages and hours of work, but to unwholesome habits of life that are encouraged by dull, shabby, unsanitary homes. Investigation has proved that the labor turnover at a plant can be more than cut in half by providing the employees with decent houses, good drinking water, proper facilities for washing, gardens, hospitals, healthy and sufficient milk supplies, schools, rest and recreation centers, relief, compensation and insurance funds and properly supervised commissaries.

Nothing that has to do with the operation of a mine is more important or more worthy of careful study than human fatigue. The development of energy in the body is almost identical with the development of steam in a boiler. In order that a workman may have a normal amount of muscular energy, he must be fed plenty of fuel, have sufficient oxygen with which to burn it and possess a system with ability to carry off

the ashes or waste. When one of these functions fails to operate efficiently, the result is body fatigue.

Hardly a company but has on its pay-roll dozens of worthy workmen who are deficient in energy because of conditions that might be removed. Employees, and especially housewives, should be taught the value of a mixed diet of food. They should be educated to know how to fill a lunch box and what to put in it. Much benefit comes from providing clean places for the men to congregate, rest and eat.

In every effort to remove fatigue the manager's plans have to include a carefully prepared discussion of personal hygiene that must be got across to the employee. Not much can be accomplished unless there is care of the individual by himself. The workman should be made to feel the importance of regular meals, thorough mastication, hours of rest and sleep, ventilation of rooms, regularity of movements from the bowels, the cultivation of cheerfulness, and above all the necessity of keeping a clean nose and mouth. The time is coming when no man, capitalist or laborer, will eat a meal without first washing his teeth and hands.

More than 50 different varieties of disease-producing microorganisms have been found to inhabit the mouth. When these bacteria are swallowed with food, they cause fermentation in the stomach, and then passing into the intestines produce poisons that are absorbed and create body fatigue. At the same time they lower the individual's resistance to disease. As to hands, it has been found that although there is no known method of perfect disinfection of the hand, culture tests prove that the number of germs remaining on the hands after washing is very much less when the man uses a brush and afterward rubs with a rough, sterile towel, than when only soap and water are used. Paper towels are a menace in that they do not remove the bacteria.

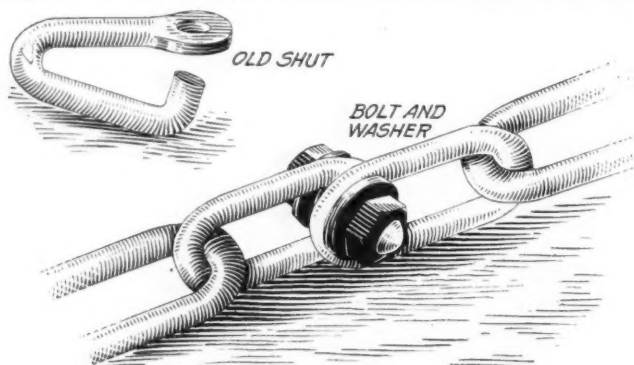
The foregoing thoughts are not written with any idea of even covering a part of the problem of health in its relation to industry, but are presented for the sole purpose of arousing the employer's interest in a subject that is vital to the solution of present-day troubles. This is no time to strike the flag without firing a shot, and the best kind of shots to fire are those that are aimed to root up and destroy the things that breed discontent and create class hatred.

IDEAS AND SUGGESTIONS

Temporary Chain Repairs

BY CHARLES H. WILLEY
Concord, N. H.

Often there is need to quickly make temporary repairs to a parted chain or to join two bights of chain together. It has several times come to my notice that



DETAILS OF TWO MAKESHIFT CHAIN REPAIRS

many men try tying the chain, if it is a small one, or binding the two ends with wire. Having used the two makeshift repairs here shown with much satisfaction, I am passing them along to others.

Surveying Without an Instrument

BY T. EDWIN SMITH
Coalhurst, Alberta, Canada

It is often necessary to make a survey when a transit is not available or convenient, and in case any reader of *Coal Age* should find himself in that predicament the following hints may prove useful.

I once had occasion to survey a coal mine and connect the underground survey with the surface survey when my only apparatus was a new steel tape. A section line ran near the mine and two stakes on this, one a quarter of a mile and the other a mile and a quarter away, enabled me to extend the line and mark it as was necessary.

I selected a point on this line, extended, that would be convenient to the top of the slope and drove a stake marking the station. On this line and back toward the flags at the section corner I measured a distance of 20 ft. and marked it with a pin. I sighted then toward the mine and on the line, and 20 ft. away located another point and marked it with a pin. The last part of the work at this point was to measure the distance between the two pins. In this case it was 25 ft. 6 in.

I now had a triangle located on the ground with one vertex at the station of the survey and two sides coinciding with two courses of the survey. Now knowing the bearing of one line, I had only to solve for one angle of the triangle whose sides were given in order to compute the bearing of the other course.

There are two ways of computing this angle. First, call the angle included between the two lines A and the side opposite that angle a , then

$$\cos A = \frac{b^2 + c^2 - a^2}{2bc}$$

It does not matter which side we call b . This formula will give two results for one of the other angles, but as we are concerned only with one this does not matter. From the data given

$$a = 25.5 \text{ ft.}$$

$$b = 20 \text{ ft.}$$

$$c = 20 \text{ ft.}$$

$$\cos A = \frac{400 + 400 - 650.25}{800} = \frac{149.75}{800} = 0.18719 \text{ and } A = 79^\circ 13'.$$

This gives the angle, and the course run will have the bearing $S 10^\circ 47' W$.

When two legs of the triangle are the same length the angle may be computed as follows:

$$\sin \frac{1}{2} A = \frac{\frac{1}{2} a}{c}$$

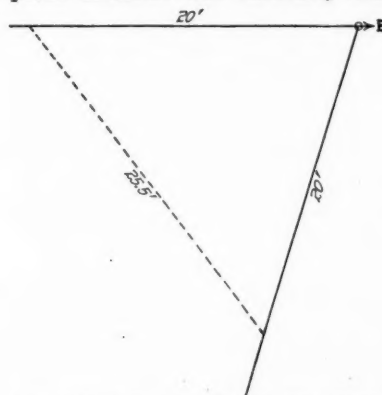
In this case it works out:

$$\sin \frac{1}{2} A = \frac{12.75}{20} = 0.6375$$

$$\frac{1}{2} A = 39^\circ 36' 30''$$

$$A = 79^\circ 13'$$

At this mine the coal was hauled up a slope and it was necessary to calculate the rise in order that the thickness of cover over the coal might be placed on the map. The pitch distance was carefully measured, then



METHOD OF LOCATING TRIANGLE

the horizontal distance was measured by breaking chain, a carpenter's level being used to keep the tape level and a sharp pointed plumb bob allowed to drop two or three inches, marking the horizontal steps. The slope was 190 ft. 3 in. long while the horizontal distance was 170 ft. 5 in.

The table on pages 4 and 5 of the "Coal Miners' Pocket Book" enables the odd inches and fractions to be reduced to decimals of a foot without trouble.

From trigonometry, the cosine of the angle of inclination is equal to the horizontal distance divided by the pitch distance.

$$\cos \text{ angle of inclination} = \frac{170.4167}{190.25}$$

The angle of inclination is therefore $26^\circ 31' 30''$.

The rise of the slope is equal to the pitch distance

times the sine of the angle of inclination. In this case it was 84.85 ft. or, say, 85 feet.

Inside the mine I found a situation somewhat more involved. A narrow slant turned off the entry at such an angle that long measurements were impossible. The timbers and the coal rib made it impossible to lay off definite distances in each direction and then measure the third side. Having marked the intersection of the center lines of the two places, I sighted down the entry toward a light placed at the face and located to points on two ties several feet away. I drove small nails in these ties and connected them with a cord. Next I sighted toward a lamp at the face of the slant and in a tie drove a small nail at a distance of 9 ft. 9½ in. from the corner. From this mark the tape was stretched to the entry between timbers and as near as possible to the corner of the coal and its intersection with the cord stretched previously in the entry noted. The distance up the entry was measured and the cross measurement taken. This provided all the data necessary for computing the angle. The three sides were respectively:

$$a = 9' 9\frac{1}{2}" \text{ or } 9.77 \text{ ft.}$$

$$b = 8' 6" \text{ or } 8.5 \text{ ft.}$$

$$c = 8' 1\frac{1}{2}" \text{ or } 8.125 \text{ ft.}$$

The angle made by the crosscut with the entry was thus found by computation to be 52° 20'.

This method can be used not only when a transit is not available, but is useful during a high wind; for a steel tape stretched close to the ground is but slightly affected by a wind that would render observations taken with a transit unreliable.

The accuracy of the results will depend upon the care taken in sighting the lines and measuring distances. In general the results are as close as those obtained from ordinary mine surveys made with a transit.

Mica Insulated Armature Coils for Use on Alternating-Current Generators

Failure of armature coil insulation is the most common single cause for generator shutdowns. These are invariably expensive, either through loss of revenue or repair charges, or both. A perfect insulation—one that never fails—is unknown, at least at present. Mica is probably the best available material for insulating purposes.

The Westinghouse company and other manufacturers are now finding mica a solution for some of the problems of the large-capacity, high-voltage and high-speed designs of electrical machines demanded by the up-to-date power plant.

Mica is a first-class dielectric. Its insulation resistance increases with temperature—a valuable characteristic for higher temperature work, and in direct contrast with the properties of treated tapes, in which the insulation resistance and loss increases rapidly at temperatures above 100 deg. It is unaffected by tem-

peratures far in excess of those encountered in the modern, well-ventilated alternator. It is impervious to the static discharges present in all high-voltage machines. It is resilient and retains its resiliency indefinitely—thus helping to hold the coil tight in its slot. Mica is a mineral obtained in the form of large

crystals. These split readily into thin, parallel-sided laminae, or flakes. The flakes are pasted uniformly on cloth or paper to facilitate handling and to provide a mechanical support during application.

In the form of a "wrapper"—that is, pasted on large sheets of specially treated paper—mica is used on all modern alternating-current generators on the straight sides of each armature coil, to provide insulation between conductor and iron, the operating voltage of the machine determining the number of turns, or the thickness of this insulation wall. All known in-

insulating materials are relatively poor heat conductors. This is equally true of mica and treated tapes. Therefore the tighter and the thinner the wall, the better are the heat radiating characteristics of the coil. For the lower-voltage machines the mica wrapper is applied as tightly as possible by hand. For the higher-voltage windings (in general 6600 and above), where the insulation wall must be relatively thick, special machines apply the wrapper under heat and pressure, and finish it to a solid, compact wall.

Frozen Rope Causes Accidents

Manila or other fiber rope is made brittle by freezing, and should be thawed before being used. Accidents happen when this precaution is neglected.

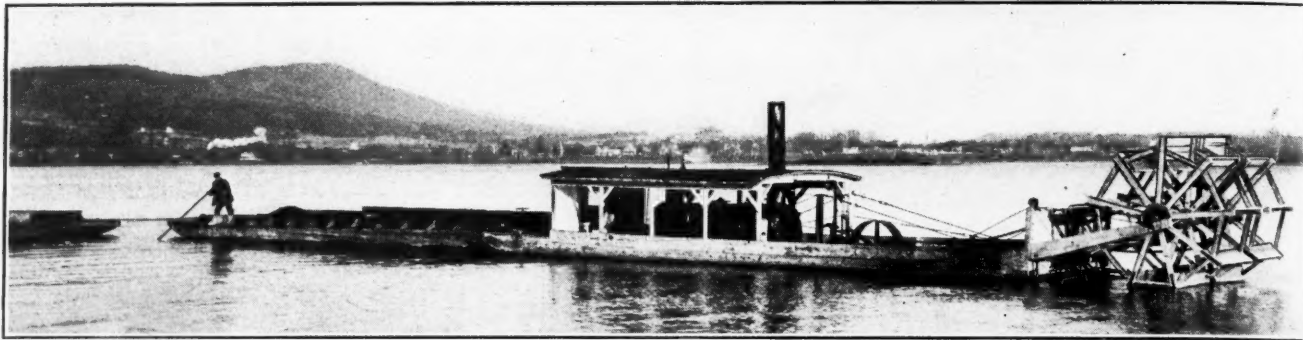
Few contractors take proper care of fiber rope; a neglect of handy rope and of rope used for tackle is an extremely flagrant waste of material. Fall rope and those used in standing rigging do not absorb much moisture, soon dry out in the wind, and are comparatively free from dirt. No special care need be taken to prevent them from freezing. With general utility rope the case is different. A manila rope contains only a small amount of natural moisture, but it will absorb as much as 30 to 40 per cent. in a damp atmosphere.

The moisture does no harm, but the freezing of the contained water makes the fibers brittle and the rope weak; therefore the frost should be thawed out before the rope is used for heavy lifts or pulls.

Dirt is chiefly objectionable because it reduces the working life of rope. When working, the rope fibers move on each other and the grit in the dirt cuts and frays them rapidly. On a construction job a visitor recently had to pick his way over the tangle of handy rope and tackle left lying where last used, and frost was in every inch of this rope.

When finished with a rope it should be put where it will not freeze or be ground into the mud; if this is impracticable, coil the rope and set this coil on a pile of boards or on any other handy platform so that it will have some chance to dry.—*Engineering News-Record*.

THE many suggestions, mining kinks and wrinkles published in the Ideas and Suggestions Department of COAL AGE are of great practical value to all readers actually engaged in operating mines. From the 10,000 and more men the paper reaches each week there should come a much larger number of such ideas. There are clever arrangements of a simple and practical nature in use at all mines. What may be an old story to one is likely to be just the idea some other fellow is looking for. We particularly invite all COAL AGE readers to send us ideas and suggestions suitable for this department. Everything published is paid for at a liberal rate.



Handling River Coal at Harrisburg

BY HENRY J. EDSALL
Philadelphia, Penn.

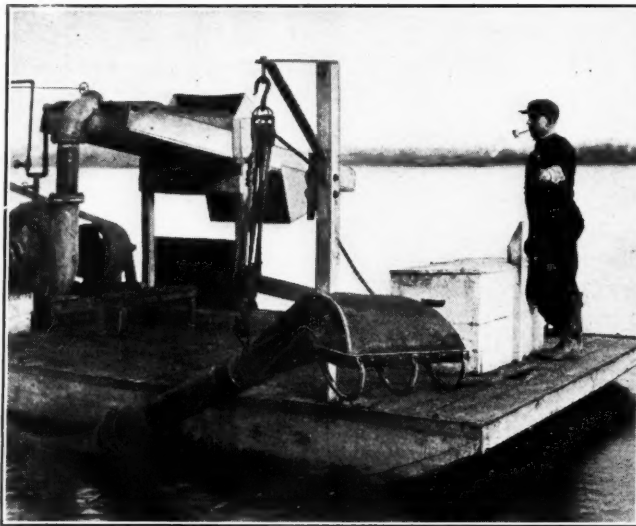
THE dredging of small anthracite coal from the rivers that flow through the anthracite coal region of Pennsylvania, or that have branches in this region, has come to be quite an industry. Along the Susquehanna, in the Harrisburg region alone, the amount of coal taken out of the river each year probably exceeds 200,000 tons.

This coal is washed down the river in times of high water, especially in the spring. It settles to the bottom in the quieter stretches where there is comparatively little current. There is a tendency for the coal to collect in certain spots, due to depressions in the river bottom, eddies and other causes. This coal forms into beds, some of which are quite large. The usual method of dredging the coal in the Harrisburg region is to suck it up with a rotary dredge pump. This has a 6-in. suction pipe with a bonnet on the lower end about 18 in. wide and an intake opening through which the coal is sucked as the bonnet moves along the

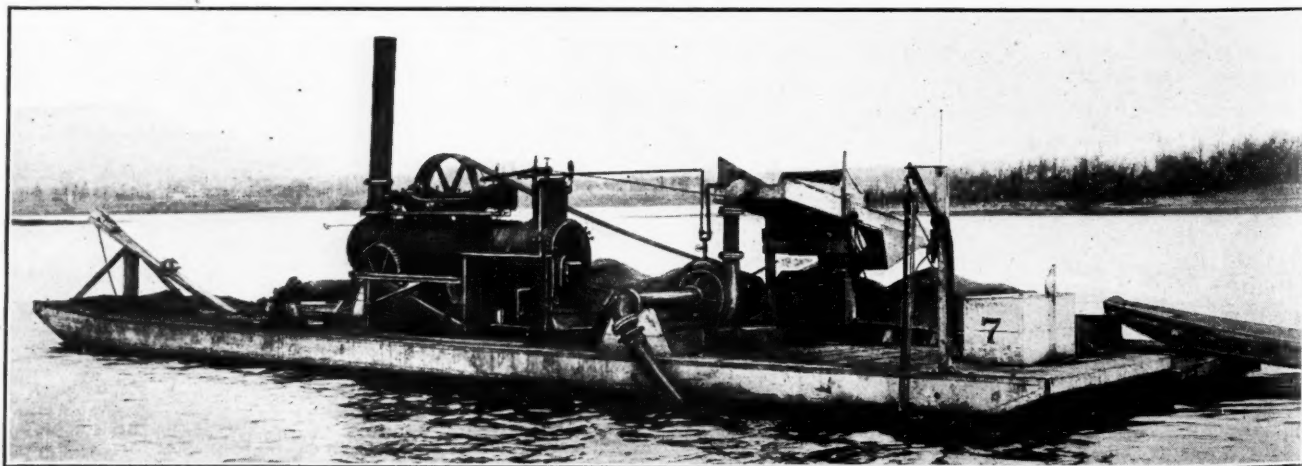
river bottom. The dredge pump is set up on a flatboat, which is operated by means of a horizontal boiler and engine. In the bow of this boat is a small-diameter drum, 3 or 4 ft. long, on which an anchor rope can be wound.

When a bed of coal is located the dredge boat is taken to the upper end of the bed, the anchor thrown overboard, and then the dredge drops downstream until the anchor rope is paid out. The pump is then started and the suction end lowered into position so that the dredging operation may begin. At the same time the drum at the bow begins to slowly wind up the anchor rope, power being obtained for this purpose by an auxiliary drive from the engine. The dredge thus moves forward slowly until the anchor rope is wound up or until the bed of coal is passed over.

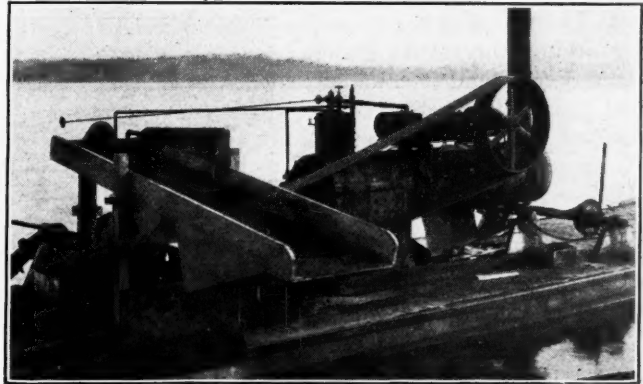
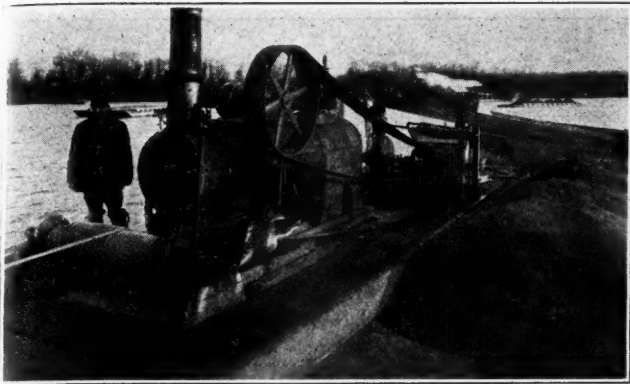
The dredge pump discharges the coal and water to a screen about 6 ft. long through which the water washes the mud and fine coal. The good coal goes



SUCTION NOZZLE OF THE DREDGE



CLOSE UP VIEW OF THE SUCTION DREDGE WITH A FLATBOAT ALONGSIDE



VIEWS OF THE MACHINERY INSTALLATIONS AT OPPOSITE ENDS OF THE DREDGE

over the screen to a flatboat tied alongside the dredge and is helped over the end of the screen by an attendant with a hoe. This attendant allows more or less coal to remain at the lower end of the screen to act as a dam to keep any water from washing over the end instead of going through the screen.

The flatboats for transporting the coal are about 50 ft. long by 10 ft. wide, and are decked over. The coal is piled on the flat deck, which is provided with 12-in. planks set on edge along each side to keep the coal from spilling over. These boats will carry from 15 to 20 tons each. For moving the flatboats there are steamers of about the same size as the coal boats but equipped with paddle wheels at the stern. The paddle wheels are driven from a horizontal combination engine and boiler by means of a belt drive to a countershaft, thence through a chain drive from the countershaft to the paddle-wheel shaft. One of these steamers will handle several loaded coal boats at a time, and they look quite picturesque with their paddle wheels churning up the water at the stern and the flatboats in front and possibly alongside.

The unloading of the coal from the boats with a minimum amount of labor is somewhat of a problem, since each boatload is a comparatively small amount; also on account of the coal being spread over a considerable area compared to the depth of the pile. To eliminate labor, a mechanical loader must go over the whole area of the deck and clean up all the coal; otherwise handwork is necessary. The unloading arrangement shown in the accompanying illustrations has accomplished this result almost perfectly, as it covers practically the whole area of the deck and leaves only a thin layer of coal that can be easily cleaned up by one man. This equipment will handle the coal at a rate of over 60 tons per hour, so that a boat can be unloaded in about 15 min. The power required to operate it is a

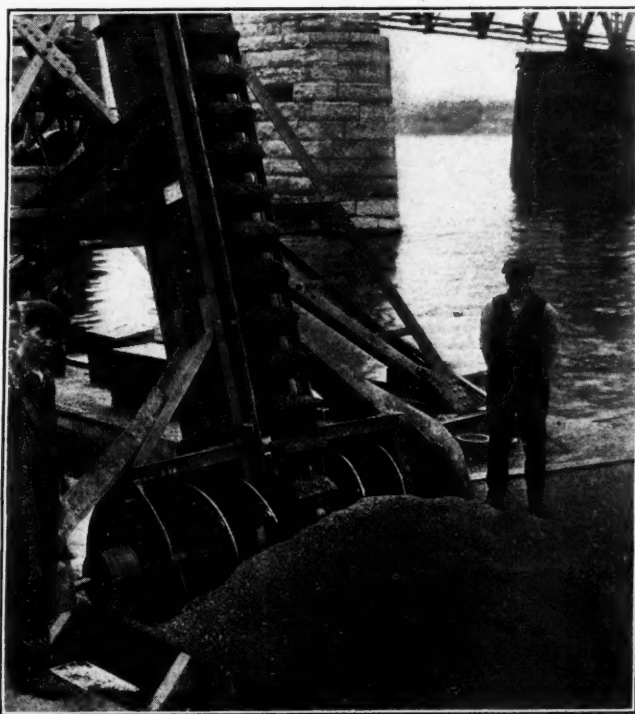
small item of expense, the motors being of $7\frac{1}{2}$ and 3 hp. respectively.

This arrangement includes three separate parts—the elevating element, consisting of a chain and bucket elevator with a spiral feeder at the lower end, a belt conveyor to deliver to the trucks and a 10-ton steel tank to act as an equalizing reservoir between the elevator and the belt conveyor. The machinery and the tank are supported on steel framework resting on two flatboats far enough apart to allow the coal boats to pass between them. This method of support was adopted largely because the most convenient point for unloading the coal at Harrisburg is in the park along the river front, where it is out of the question to consider building anything of a permanent nature either in the river or on the shore. This scheme, however, has other advantages since it keeps the structure symmetrical, with the elevator and bin in the center and as low as possible. Furthermore, the complete equipment can be removed and laid up for the winter to avoid damage by floods and ice.

It will be noticed that the elevator is pivoted at the upper end. This allows the foot to be swung forward, which also raises it, thereby providing for different

levels of the boats with varying loads and also making it possible to get the loader into position and out of the way without interference.

The elevator is about 26 ft. long center to center of head and foot wheels and is of the single-strand centrifugal-discharge type. The standard malleable iron buckets are 12 in. long and 6 in. wide, and are attached to every link of the No. 710 malleable iron chain. Since the elevator operates on an incline, it was considered advisable to attach flatirons across the backs of the buckets and let these slide up and down in angle-iron guides in order to support the buckets on both the up and down runs and keep them from sagging or sway-



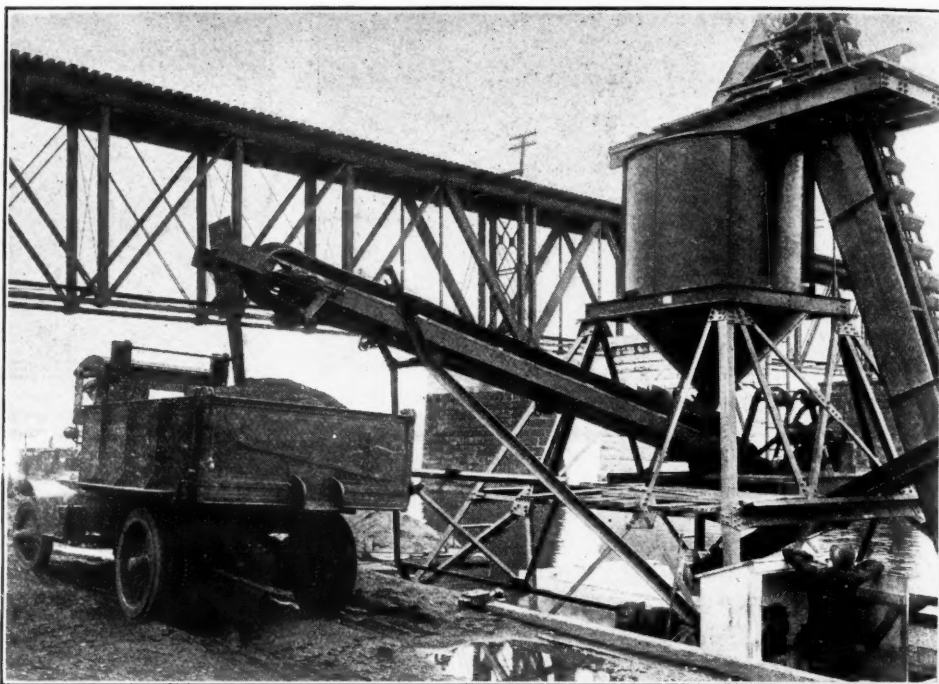
FOOT OF THE UNLOADING CONVEYOR

ing. There is also a steel casing around the return run to avoid danger and to catch any coal that spills from the ascending buckets or from the discharge at the head. The elevator foot shaft is extended at both sides for the spiral feeding device, which consists of a spiral ribbon 32 in. in outside diameter and with 12 in. pitch, the blades being made of $\frac{1}{2}$ x 3-in. steel flats.

A steel trough is provided at the back of the ribbon and this extends part way underneath. The coal thus cannot get out at the back; neither is there danger of injuring the man at the rear of the elevator through coming into contact with the ribbon. The ribbon is made right and left hand so that the coal from both sides of the elevator is pushed in toward the buckets, which are well filled if the foot of the elevator is kept against the coal properly. The coal is almost entirely cleaned up from the decks of the boats, the small amount left being easily shoveled up by one man and fed to the elevator.

The elevator discharges at the head in the usual manner, over a chute into the 10-ton circular steel tank. This tank is 8 ft. in diameter and is made of $\frac{3}{16}$ -in. steel plate properly braced and stiffened by angles and channels. The bottom is hopped and fitted with a gate for delivery to the belt conveyor. Across the top of the tank beams are placed to support the head of the

elevator. The frames that support the tank and machinery have two legs resting on each flatboat, the load being distributed on the deck of the boat by means of channels running part way across. The possible rocking of the boat is taken care of by a pin connection, which insures flexibility. The belt conveyor which runs from the tank to the trucks is 24 ft. long center to center of head and foot wheels and has an 18-in. five-ply rubber belt. This belt runs over standard troughing idlers on the carrying run and returns over standard return idlers. It is supported by means of a steel boom with a strut underneath which allows of adjustment in height of the boom. The belt conveyor has a somewhat larger capacity than the elevator, so that a truck can be loaded quickly, this extra capacity being also needed by the belt conveyor on account of its intermittent operation, which means that it has to handle the same amount of coal as the elevator, but in less time. The elevator operates continuously until the boat is unloaded, whether a truck is being filled or not. The bin, however, sometimes becomes filled when the trucks are not taking coal away fast enough, and in this case the elevator has to be stopped until some of the coal is taken out of the bin. The $7\frac{1}{2}$ -hp. motor is located on the platform at the head of the elevator and is geared direct to a countershaft which also acts as a pivot shaft for the elevator. From this countershaft a



TOWER, HOPPER AND CONVEYOR OF THE UNLOADING MACHINE



AFFORDS AN EXCELLENT GENERAL VIEW OF THE UNLOADING STATION

chain drive extends to the head shaft of the elevator. The 3-hp. motor is located on the platform at the foot of the belt conveyor and geared direct to the conveyor foot shaft. The starting boxes for the motors are in a small closet on the flatboat nearest the shore, the feed wires leading from an underground conduit to this closet. There is also a push button near the delivery end of the belt conveyor so that the truck driver can stop this belt when his truck is full.

New English Coal Field to Be Extensively Developed

North Nottinghamshire, known to lovers of beautiful scenery as "The Dukeries," will soon see the development of its large coal resources on a hitherto unattempted scale. Some of the deposits are being worked already, but the greater part of this immense coal field is as yet untouched.

Enough coal exists in the area mentioned to insure the prosperity of this portion of the county for the next 100 years. Most of it is comparatively easy of access. Indeed, there is no coal yet to be developed in any part of England that lies nearer the surface than that in this district, and the demand for it is practically unlimited. Being of a hard texture, it is particularly suitable for transportation, and hence it is not surprising to find that before the war 40 per cent. of the output of the Nottinghamshire pits was exported, notwithstanding the fact that, lying in the center of England, it is farther from the ports than any other coal-producing area.

The Germans were particularly willing buyers. They found this coal far better for their blast furnaces and locomotives than their own Silesian and Westphalian product, and, thanks to British shipping, which, while bearing away from us the sources of our wealth brought back German manufactures as return cargoes, they also found it cheaper. Its chief excellence consists in its comparative freedom from sulphur—an important consideration in the making of steel. As compared with $2\frac{1}{2}$ per cent. of sulphur found in Welsh coal, the coal of North Nottinghamshire contains only $\frac{1}{2}$ per cent.

The principal agency concerned in the sinking of new pits is the Bolsover Colliery Co., whose pit near Mansfield, known as Crown Farm, holds the world's record for output in a given time, 4850 tons having been brought to the surface in 7 hours 40 minutes¹. The company also runs two other important pits at Bolsover and Cresswell, in Derbyshire. The Dukeries comprise, in the main, the estates of the Duke of Portland, the Duke of Newcastle, Earl Manvers and Lord Savile.

The first of the new pits, at Blidworth, known as the Rufford Colliery, was completed just before the war by the Bolsover Colliery Co., and is now turning out some 2300 tons a day. This could easily be increased to 4000 if the necessary labor were available. Another pit on the Duke of Portland's estate at Clipstone, four miles from Mansfield, will be sunk by the same company as soon as the Government gives permission: All the surface work has been done, and sinking was about to commence when

the Government commandeered the labor and material. Coal is expected to be reached here at a depth of 1860 feet.

The next collieries to be started will be at Blidworth, by the Newstead Colliery Co., which has acquired the mineral rights over an area of five or six thousand acres. Not far off is Ollerton, where the Butterley Coal and Iron Co. and the Stanton Iron Co. have jointly arranged to work the coal under Lord Savile's estate. Belonging to the same owner is Bilsthorpe, with an area of 6000 acres, where a borehole has been put down by the Stanton Iron Co. and the coal shown to be satisfactory. Rufford, to which allusion has already been made, possesses the thickest coal bed of any so far proved in this neighborhood.

Marked for later development are the coal deposits under Sir Charles Seely's Sherwood estate, including Oxtun, which lies between Blidworth and Farnsfield. A company is to be formed to work the coal, and negotiations are also about to be opened with Earl Manvers to deal with that on the Thoseby estate, where there is satisfactory reason to suppose the deposit is good.

It is extremely probable that the Wigan Coal and Iron Co., which now has one colliery at Manton, will sink another on the Duke of Newcastle's estate near Work-sop. About 20,000 acres are here available.

In nearly all the projects mentioned the leases have been actually let, but to sink and equip one of these collieries for an output of 4000 tons a day will cost from £650,000 to £750,000, without reckoning anything for railways and workmen's dwellings, before a single ton of coal is raised. At a moderate computation between four and five millions sterling will be invested in the exploitation of this new coal field. Each of these collieries will employ, on an average, 2700 men and boys, which will mean some 20,000 miners, or a new mining population of 100,000 souls.

Railway extensions are projected to deal with the resulting growth of trade and population. The Mansfield Ry., which owed its inception a few years ago to the advent of fresh collieries in the neighborhood, will be connected by a branch line with the Great Central Line from Chesterfield to Lincoln at Blidworth, where the new population is already being housed in a village laid out on town-planning lines. A hundred and seventy houses had been erected when the outbreak of war stopped building operations, but the complete design provides for 500 dwellings. Similar model villas will be laid out for the other collieries, since the coal seams are so numerous and of such a thickness that 40 years would be required to exhaust one of them. Below the upper hard coal lie other beds, some of which can certainly be worked at a profit. At the present rate of production this new coal field will not be exhausted for 150 or 200 years. Thousands of houses are already in contemplation and would have been erected ere this but for the war.

IT HAS BEEN STATED by an authority conversant with pulverized-coal furnace practice that the life of a furnace burning powdered fuel is not as long as that of other forms of furnaces. It can also be stated that the life will be the same as that of other forms of furnaces operating under the same capacity rating. It is considered, however, that the expense of furnace renewal is more than offset by the advantages of using pulverized coal.

¹The author of this article is evidently unfamiliar with such American operations as the Orient mine of southern Illinois, and Vesta No. 4, near California, Penn.—EDITOR.

Agencies in the Transformation of the Connellsville Region

BY JOHN L. GANS
Connellsville, Penn.

THE change in the character of the Connellsville coke region, from a beehive coke manufacturing to a coal-producing center, is being effected through what may be termed four different agencies. In order of sequence by which they have become operative they are: The adaptation, whole or in part, of existing coking plants, both merchant and furnace-owned, to the shipment of byproduct coal; the acquisition and development by furnace and steel interests of Connellsville coking coal as a source of raw product for the manufacture of byproduct coke at the point of consumption; the association of coke producers who are owners of coking coal with steel interests in the joint ownership and operation of byproduct coking plants outside of the Connellsville region, and the establishment of relations between a steel producer, who is also a byproduct coke producer, and an independent Connellsville coal-land owner, whereby the latter becomes a producer of byproduct coal for the exclusive use of the former.

TRACTS BEING DEVELOPED FOR BYPRODUCT COAL

The order of importance is perhaps different from that just given and is very likely to undergo changes as developments grow apace. At present, however, the shipment of raw coal from plants originally designed, and for a long time operated, as coking plants only, but now partially and in some instances wholly diverted to the new purpose, takes the lead in volume of tonnage. The development of tracts by new mines to be devoted solely to the production of coal for byproduct coking is yet in the primary stages, but it is fast assuming such proportions as will eventually make these operations very important, if not the most important, factors in the new order.

Several merchant producers of coke have been shippers of byproduct coal in varying quantities for a number of years past and within the last year have engaged somewhat more extensively in that line. Many of the more recently constructed plants were equipped for loading coal direct from the tipples into railroad cars, and others have made such provision, hence the number of coal-loading plants has gradually increased as the byproduct industry has expanded. The Republic Iron and Steel Co., operator of the Republic plant of 400 beehive ovens, has been shipping its excess coal to its byproduct plant for several years, together with the partial, and sometimes the whole, output of the Martin plant, which has an equipment of 244 beehive ovens. The Bowood mine of the same company is an exclusively coal-loading plant, as is also the Atchison mine since the permanent abandonment of its 120 beehive ovens.

All of these operations are in the Lower Connellsville district, from which virtually all of the byproduct coal is being shipped. Early last spring the 470 beehive ovens of the Brier Hill Coke Co. in the Lower Connellsville district were blown out, since which date the

entire mine production has been going to the Brier Hill Steel Co.'s byproduct coking plant at Youngstown.

The LaBelle Coke Co., operating 200 ovens, has within the past two years completed a barge-loading plant and ships coal to the LaBelle Steel Co., Steubenville, Ohio, for byproduct uses, while continuing part of its beehive ovens in blast.

Since last midsummer the H. C. Frick Coke Co., a subsidiary of the United States Steel Corporation, and the largest coke producer of the Connellsville region, has been making increasingly larger shipments of coal from a number of its mines in the Lower Connellsville district to the Clairton byproduct plant of the Carnegie Steel Co. As additional units were made ready for firing at this plant, coal shipments have been increased through cutting down the number of beehive ovens in blast at the several mines and diverting the coal by an elaborate underground electric haulage system to barge-loading tipples on the Monongahela River. This shifting of the destination of mine output has progressed until four large beehive oven plants—Colonial No. 4, Edenborn, Lambert and Ronco, with a total of 1612 ovens—have been relegated to the inactive list, while the coking capacity of the Leckrone plant has been cut down from 516 to 110 ovens.

MANY MINES OVERHAULED AND IMPROVED

Meantime the Ralph, Palmer and Gates mines in Fayette County and the Dilworth mine in Greene County, at which no coke has ever been produced although some were so designed, have been overhauled and extensively improved and their output is being sent to Clairton. The 100 ovens at the Bridgeport mine continue to be operated, but the mine capacity has been increased and the excess coal output is shipped by river. At the Maxwell mine some miles up the river barge-loading preparations are under way, this being another step in the comprehensive plan for the Frick company to change its mines which are tributary to the Monongahela River into producers of coal for the Clairton byproduct plant.

To date there has been but a single instance of an owner of Connellsville coking coal, and operator of beehive ovens in the region, joining with a steel producer as owner and operator of a byproduct coking plant. That is the union of the W. J. Rainey interests with the Alan Wood Iron and Steel Co. in the formation of the Rainey-Wood Coke Co., which has a plant of the Koppers type of ovens in course of construction at Swedeland, Penn. This plant is to be supplied with coal from the mines of the Rainey interests right in the heart of the Connellsville region, and long the source of supply for the beehive ovens on the property. (This enterprise was more particularly mentioned in *Coal Age* in the issue of Aug. 8, 1918.)

Several developments are in progress in the Greene County extension of the Lower Connellsville district which are to be producers of byproduct coal for the

exclusive use of the parent steel and furnace interests. At present the most notable and farthest advanced of these enterprises is that of the Buckeye Coal Co., a subsidiary of the Youngstown Sheet and Tube Co. The plant of this company, briefly described in *Coal Age*, issue of Feb. 6, is located at the new town of Nemacolin, and will have an ultimate capacity of 6000 tons of coal per day, all of which will go to the byproduct oven plants at Youngstown.

What is herein termed as the fourth of the series of agencies through which the Connellsville region's evolution is being brought about has thus far but a single example. This is found in the comparatively recent purchase by the Jamison Coal and Coke Co., one of the leading merchant coal and coke producers of the Greensburg-Connellsville district, of 575 acres of coking coal in the Perryopolis section of the Connellsville district, which will be devoted to the production of coal exclusively. The property, which is already under development through two slope openings, will have a capacity of 2000 tons per day. The entire output will go to the byproduct plant of the Bethlehem Steel Corporation at Sparrows Point, Md. The new operation adjoins the holdings of the Washington Run Coal and Coke Co., one of the leading merchant producers of the Connellsville region and a long-time shipper of byproduct coal.

Even with the multiplication in number and variety of means whereby the coal of the Connellsville region, once held sacred to the production of beehive coke, is being utilized in the manufacture of coke, no alarm is felt among coke producers over the transformation that is in progress. Firm in the faith that Connellsville coal is as essential to the production of high-grade byproduct coke as it has been in the manufacture of coke by the more primitive process, the operators are accepting, even welcoming, the situation as an assurance that the prosperity of the Connellsville region is by no means at an end. Instead, it is the belief that, having a market for its principal product in two forms, rather than one as formerly, they are infinitely better positioned than when they were subjected to the "flings of fortune" in the "prince and pauper" days.

Germans Use Driving Belts of Paper

Some particulars of the paper driving belts which are now being introduced into German workshops are given in the *Bulletin des Usines de Guerre*, a translation of which appears in the *Compressed Air Magazine*. The paper is cut into narrow bands, which are then spun. The belts are made by a weaving or braiding process.

Woven paper belts are of two kinds—paper fabric and paper thread belts, the former being the more frequently used. The fabric is first cut into bands 40 m. (131.12 ft.) long, which are subsequently made up according to the desired width and thickness. A core of strengthening material is interposed, either cotton or sheet metal, though more recently these cores have consisted of paper thread and metal wires interwoven. The core is surrounded with the paper strips and the whole sewn with strong thread. Belts so prepared are said to be very flexible and to wear satisfactorily. Woven paper belts have a tensile strength of from 100 to 125 kg. per centimeter of width (560 to 700 lb. per inch of width).

Even Ireland Has Coal News

The Province of Connaught in Ireland lies in the northwest of that island. One of the counties in Connaught—Roscommon—has in the northern corner, which is wedged in between the counties of Leitrim and Sligo, the village of Arigna, where are located producing coal mines. It is stated that this coal has been successfully used at the Sligo gas works, though the coal is said to be of anthracitic variety. The field is commonly known as the Leinster coal field, for the coal is mostly found in that county, though Arigna is the principal point of development and after it the coal field is occasionally named.

The Government of Great Britain and Ireland is endeavoring to ascertain the quality of the coal in the Tyrone field in Ulster, which field passes under Lough Neagh, a comparatively large lake forming a sort of common corner monument for Tyrone, Londonderry, Antrim, Down and Armagh Counties. About \$75,000 is to be expended toward experimental borings. They will be made near Lough Neagh, for it is believed that sheet of water masks the most desirable portion of the field. Coalisland is the most important town in the field, and after it the Tyrone field is often named.

PLAIN ENOUGH

Written Expressly for Coal Age

BY BERTON BRALEY

THINK of this a moment, prophet sad and glum:
Here's a world that must be built anew,
Built with tools and products of the shops that hum—
Has that little fact occurred to you?
Some one has to do it; who can do it best,
Europe, lacking labor and supplies,
Or this mighty nation with its wealth unguessed?
There's an answer plain before your eyes!

WE don't gloat at Europe in her misery,
Neither do we hold our losses light;
Yet the truth's before us, who can help but see
Logic of the facts that are in sight.
Men must live and labor; we have goods they need,
Products of our industry and brains,
Trade is therefore certain, as who runs may read,
Certain as the sunshine or the rains.

THINK of this a moment, blue and fearful soul,
Prophet of disaster far and near:
Trade means busy workshops, shops mean streams of coal,
Keep your courage up and never fear.
Chuck your dour statistics, take a broader view,
Men must have the fruitage of our skill.
There's a world that's waiting to be made anew,
We can help to do it—and we will!

Increasing Cage Safety

BY THOMAS PRICE
Nanaimo, B. C.

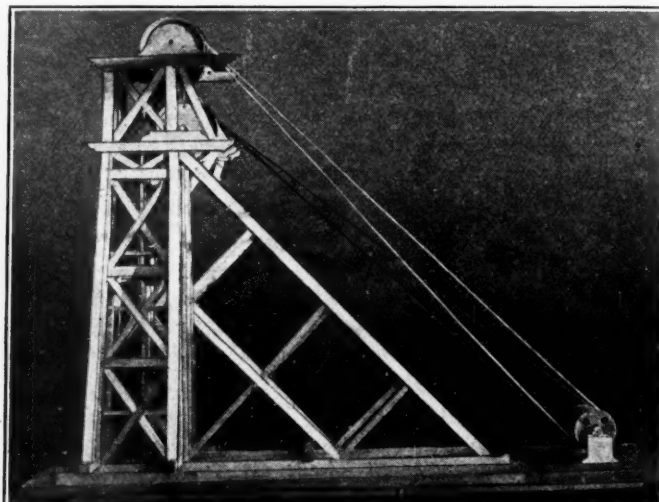
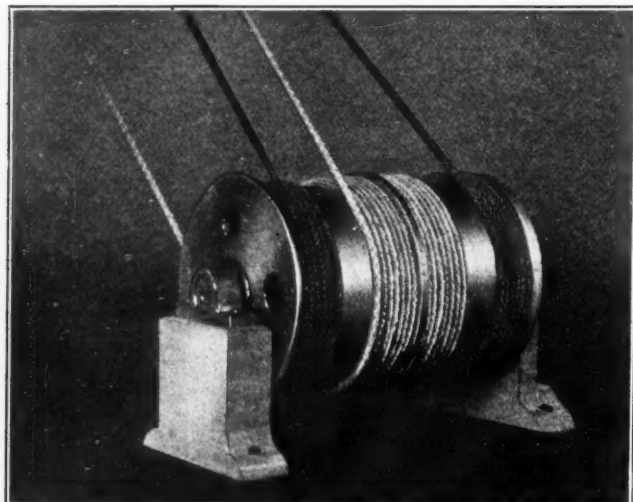
SYNOPSIS—A disastrous accident resulted from a breakage of the hoisting cable and a failure of the safety catches on the cage to function properly. Extensive tests showed that these catches were at best unsatisfactory. A scheme for attaching two ropes to each cage, either one of which shall be capable of sustaining the load, was then devised. This is to be tried soon.

IN SEPTEMBER of last year a serious accident occurred at the Protection Mine of the Canadian Western Fuel Co., Ltd., due to the breaking of the descending hoisting rope. This resulted in the death of 16 men. The accident occurred in spite of the fact that the cages were equipped with a type of safety catch that was considered a good one. At the time of the catastrophe the reason of the failure of these catches to work properly could at all not be accounted for.

it appear that great alterations would have to be made to the present machinery, or at least that extra winding drums would have to be added to those already in place. This would prove a costly change.

Thomas Price, master mechanic of the Canadian Western Fuel Co., Ltd., finally solved the difficulty by crossing the ropes from the drum to the two extra sheave wheels, which are placed above the present ones. Thus as one rope winds on to the drum, the other is wound off. The angle of the sheaves is adjusted to suit the center of travel of the opposite half of the drum. The ropes from the drum to the sheaves cannot possibly come together, being kept apart by reason of one rope being wound under the drum and the other over.

The size of winding rope used is 1½ in. in diameter. This could either be doubled on each cage or a smaller sized rope used, which would still increase the factor of safety. Of course, whatever size of rope is employed it should be capable of carrying the load itself with a considerable margin of ultimate strength. Each rope



METHOD OF WINDING CABLES ON THE DRUM AND A MODEL OF THE ENTIRE APPARATUS

This led to a series of thorough and practical tests of the catches. For this purpose a trestle 45 ft. high was used, and guides similar to those employed in the shaft were bolted in position and the experimental cage fitted with the safety catches. Prominent mining men were present to see the tests carried out.

Several trials with the ascending cage were made, and in some cases the safety catches did their work but failed with the descending cage, which crashed to the ground every time. A new grip was tried. This certainly acted, but those present were of the unanimous opinion that while the catches stopped the cage they were totally unsuitable, the action being altogether too sudden and dangerous. This was conclusive evidence that something entirely different would have to be devised and proved the fact that any type of safety catch was more or less unreliable.

After much scheming the idea of using two ropes on each cage presented itself. This at first sight made

will have its full share of the load. Thus at no time in its working life will any one rope under this double-rope system be subjected to the same relative stress as it would be in the single-rope system. Furthermore, there will always be a far greater margin of safety. The only extra cost outside the two additional ropes is that required to erect the extra section of framework and the sheaves.

This arrangement is to be tried out at the Wakesiah mine as soon as sinking operations are completed.

THE OUTPUT OF COAL from the Malayan collieries rose from 101,846 tons in 1916 to 155,279 tons in 1917, and would have shown a greater increase but for the difficulty in obtaining the necessary additions to the plant. There was also some difficulty in obtaining sufficient labor for the mines, due to the greater attraction offered to laborers on rubber estates, where higher wages can be earned with much lighter work.

British Columbia Operators Object to Features of New Act

Representatives of the coal mine operators of British Columbia waited upon the Executive Council of the Provincial Government on Feb. 27 to register some objections to the amendments proposed by Hon. William Sloan, Minister of Mines, at the present session of the Legislature, to the Coal Mines Regulation Act.

As is indicated by the summary of these amendments, which already has been published in *Coal Age* (p. 524, issue of Mar. 20), the first change contemplated is the inauguration of a minimum wage board that shall have power to fix districts in which such minimum wage as may be decided upon shall be made to apply. It is not stated, however, that the same wage shall be enforced for each district or that a minimum shall be applied to all the coal-mining sections of the province.

Such legislation, the operators assert, discriminates against the coal-mining industry. They say it also discriminates against collieries, as a minimum may be applied to one and not to the other. It is "vicious," it is declared, for these reasons and because it places too much power in the hands of the Minister of Mines. Further, they maintain that the establishment of a minimum wage will have a tendency to do away with contract work, under which system the coal mines of British Columbia are operated. They would have the effect of reducing production. It will, in their opinion, increase the cost of production and, the greater the cost of local coal, the larger proportion will be imported, and consequently the greater the loss of revenue to the province. The dealers, it is affirmed, were driven out of the coal market of California because of the production costs and, if it was to continue, would meet with a similar fate with regard to all the foreign markets.

Competition, it was declared, was becoming closer in the State of Washington and, when it was remembered that of the 2,000,000 tons produced in 1917 no less than 800,000 tons was exported, the seriousness of such a loss would be better appreciated. Moreover, any greater increase in production costs, which would mean beyond question a further advance in retail prices, would result in the encouragement of the replacement of coal by fuel oil. This transition was a factor which those interested in the coal trade had to face. If it persisted it simply meant that more and more capital which now was invested locally in locally produced fuel would be expended on an imported fuel and would fatten foreign profits.

Exception was taken to the proposal that the Lieutenant-Governor-in-Council should be given power by the Legislature to make such orders as may be deemed necessary from time to time for the further safeguarding of the lives of underground workers. The criticism offered was that it would result in uncertain conditions. Operators might be confronted from time to time with new regulations having the effect of disturbing their smoothly working systems of management.

The delegation took advantage of the opportunity to protest, as well, against the enforcement of the provisions of the Eight-Hour Act, which was passed by the Legislature in 1918, and which gives all those working above the surface around coal mines the same working day as those employed underground—namely, the eight-hour day. This law becomes effective on Mar. 31 next,

and it was stated that, as it would tend to increase production costs, the wisdom of permitting it to remain without change should be made the subject of inquiry.

There have been reports that the Provincial Government proposes increasing the tax on coal produced in British Columbia from 10c. to 25c. a ton. While the statement has been publicly made that such action is under consideration, no pronouncement has been made from official circles. It is thought that this accounts for the fact that the operators took occasion, when meeting the Government, to submit a petition for the reduction of the present 10c. a ton tax to 5c. a ton. One of the arguments advanced in this connection was that in Alberta the tax is only 5c. a ton and that British Columbia coal already comes into competition, to some extent, with that of the sister province. It also was asserted that the points already enumerated against any action being taken that would have the effect of increasing costs, which under present conditions were extremely high, applied to the question of taxation. It was essential that the burdens of the operators should not be made greater if the coal-mining industry was to be maintained in a prosperous state.

Fuel Oil and Its Applications

BY M. MEREDITH
Liverpool, England

Apart from its superiority to coal for marine propulsion the use of oil on railways is advantageous in countries that are not favorably situated in respect to coal supply. A typical instance is that of the Mexican Ry., where conversion from coal to oil has resulted in reductions of 32 per cent. in the weight of fuel consumed per train kilometer and of 40 per cent. in the cost of fuel. The oil can be handled from tank cars to storage tanks and thence to locomotives very cheaply as compared to coal. The wastage in handling between shipment and point of consumption (estimated at 8 per cent. to 10 per cent. with coal) is eliminated. No men are required to load up the engine or clean out ashpans. There are no ashpits to empty or ashes to be loaded up and hauled away.

Where used as an auxiliary equipment to coal-fired boilers to meet recurring peak loads the use of oil not only enables the plant to meet sudden and heavy demands, as in the case of electrical power stations, but may obviate the necessity of installing additional boilers with the growth of the average output of current.

The perfect smokeless combustion of oil fuel would prevent or abate the smoke nuisance in closely populated districts. In many instances the local authorities insist on the provisions of smoke legislation being carried out. That much remains to be done in this direction, however, is shown by the statement that in the Administrative County of London 76,000 tons of soot descend every year.

Efficiencies as high as 84.5 per cent. have been obtained on Scotch marine-type boilers using Mexican fuel oil with the pressure system of oil burning.

In the United States a large series of actual working temperature tests have shown that with coal the thermal efficiency of boilers usually varies from 66.6 to 68.1 per cent., with oil from 80.6 to 81.5 per cent.

In Great Britain fuel oil is used in industrial fur-

naces for such processes as billet heating, metal melting, riveting, bolt and nut making, and the manufacture of glass bottles. Of the three systems of burners for oil fuel the pressure jet system, in which the atomizing agent is pump pressure and steam temperature, has been developed during the last 10 years to such an extent that it is now recognized as the most economical system for use under stationary and marine boilers, and is being rapidly developed for locomotive purposes. The oil is drawn from the storage tanks by a steam pump through suction strainers, and delivered through heaters and discharge strainers to the oil fuel burners.

An interesting development is that many metal melting manufacturers have either scrapped their coke-fired furnaces or converted them to gas or oil. The principal metals being thus melted at the present moment are aluminum and what is known as 70/30 brass.

In the early years of this century a French engineer introduced the subject of oil as an auxiliary. The main advantage of auxiliary firing lies in being able to obtain at will a large increase in the power of boilers. The combustion of the petroleum does not in any way prejudicially affect that of coal; in fact, by the introduction of jets of petroleum the condition and efficiency of combustion are improved through a more complete mixture of the gases. It is therefore not correct to consider the evaporative power of coal as identical when passing from ordinary auxiliary firing.

Admitting this as a principle, but supposing the quantity of water evaporated by the coal to be constant, the extra evaporation due to the better mixing of the gases is credited to the petroleum.

In several evaporative trials made on the same boiler of a French naval vessel, when coal alone was burned at the rate of 18.8 lb. per square foot of grate area per hour, the water evaporated per pound was 9.05 lb. With

a mixture of coal and 45 per cent. oil, the corresponding figure was 11.34 lb.; with a mixture of the coal and 64 per cent. oil, 14.12 lb. In this last test the efficiency of the mixture was higher than when burning petroleum only.

These tests served as a basis for further experiment, about four years ago, by power station engineers. Their theory was that a poor quality of coal could be in conjunction with oil fuel. When used alone the inferior coal tended to cake on the links of the chain grate stokers, thereby retarding the necessary quantity of air from being drawn through the bars to complete

Plant of the West Virginia

THE panorama below affords an excellent view of the Coalton plant of the West Virginia Coal and Coke Co., at Coalton (near Elkins), Roaring Creek District, Randolph County, West Virginia, including a part of the company's batteries of coke ovens. This plant was built in 1901 at a cost of approximately \$600,000 and is modern and businesslike in appearance throughout. The coal mined is taken from the Lower Kittanning seam, through two openings, one of which may be seen at the right in the view, the other being hidden by the tippie located immediately behind the coke ovens at the left. The tippie is of steel construction and is equipped with a cross-over dump and shaking screens; four different sizes of coal are prepared at this plant.

Immediately to the right of the tippie is the conveyor, also of steel construction, by which slack is conveyed to the slack bin, which has a capacity of 2000 tons. To the right of the slack bin is the power house, and in the background the blacksmith and repair shop. About at the point where the cloud of steam is seen is



PANORAMIC VIEW OF THE COALTON PLANT OF THE WEST VIRGINIA COAL AND COKE CO.

combustion. The result was a smoldering mass, which traveled slowly along the bars and was dumped into the hopper as a partly consumed coal. On analysis this ash would probably be found to contain a high percentage of combustible matter. Therefore a much larger quantity of coal was burned per hour to maintain, say, rated evaporation, than would have been necessary had complete combustion been possible.

The theory was that when fuel oil was applied the combustible gases rising from the coal fuel bed were quickly ignited, causing the top of this mass to become incandescent, and thereby tending to aerate the bot-

tom mass, which would allow sufficient air to be drawn through to complete the combustion of the inferior coal.

Sufficient interest was taken in this theory for a large London power station to give sanction for tests to be carried out under a coal-fired Stirling water-tube boiler. One burner was introduced into each side of the boiler approximately 25 per cent. of the distance from the back to the front of the grate, the burners being opposite each other. The oil was stored in an overhead tank capable of holding three or four days' supply. It gravitated to the burners, which were of the steam-jet type, operating with steam as an atomizing agent at a pressure of about 25 lb. per square inch.

The first test was carried out on a coarse slack having a calorific value of 10,400 B.t.u., and a boiler efficiency of 69.25 per cent. was obtained. The temperature of the combustion chamber was 2648 deg. and that of the uptake 660 deg. Fahrenheit.

The final of a series of experimental mixed-burning tests was carried out on a mixture of coarse slack having a calorific value of 10,300 B.t.u. with Mexican fuel oil having a calorific value of 18,750 B.t.u. A boiler efficiency of 74 per cent. was obtained. The temperature of the combustion chamber was 2850 deg. F. and the uptake temperature 628 deg. F. The proportion of oil to coal on a B.t.u. basis was 8 per cent., and on a weight basis 4.96 per cent. The comparative costs were—with coal alone, 2.8; with the mixture mentioned, 2.62, showing a monetary saving of 6 per cent.

The tests showed that with oil at a cost per unit of weight of 2½ times the cost of coal, and burning in the aforementioned percentages, a saving is effected which should induce power station engineers to consider adopting this method of firing in the extremely large power stations of the future.

Coal and Coke Company

located the large electric ventilating fan. In fact the whole plant is operated by electricity and is as nearly fireproof as it can be made. The coal produced at the Coalton plant is used chiefly for steam, coking and domestic purposes.

The company operates 250 coke ovens, arranged in two double blocks, or batteries, and one single block of bank ovens. The latter ovens are almost hidden by the track in the foreground. The remainder of the ovens extend some distance to the left of the tipple. The average capacity of the ovens is 450 tons of coke a day, though as high as 500 tons have been produced in a single day under favorable conditions. To operate the plant to full capacity the services of about 300 men are required.

The town of Coalton is built on the hillside back of the ovens. The company owns 95 houses in this mining village and some sixty of the homes in the community are owned by individual miners. The company is planning the erection of a modern Y. M. C. A. building.



NEAR ELKINS, WEST VIRGINIA; THE PLANT WAS BUILT IN 1901 AT A COST OF \$600,000

Barking Up the Wrong Tree

BY FRANK H. KNEELAND
Associate Editor, *Coal Age*

SYNOPSIS—*Many men engaged in coal production are inventors—unfortunately, some are patentees. A device may work perfectly, yet a patent covering it may be utterly worthless. In order to be valuable a patent should cover a device that will save a fair percentage of the money previously expended per unit of output. Furthermore, the output affected must be large and the demand therefor must be extensive.*

THE coal industry, probably like all others, is not devoid of a generous sprinkling of inventors and would-be inventors. Ever since *Coal Age* came into existence scarcely a month has passed without someone, somewhere, sending in a patent specification accompanied by a request that it be given publicity. Frequently these missives are little short of the pathetic.

"I will give any responsible party a 49 per cent. interest in this invention, if he will agree to manufacture it and get it on the market." "I don't expect much from this invention, although I am satisfied of its value. All I want is a reasonable compensation for my time and trouble." "Now that I have got this device perfected, I want to get a little something out of it. I will be satisfied with a small percentage on the profit that I am sure will accrue if the thing is properly advertised and pushed." "Please advise me where I can find someone who will be willing to back this invention financially and get it before the public." These are a few of the expressions used by the inventors who write to us.

During the past 20 or 30 years I have, on several occasions, come in contact with inventors, inventions and patents. Naturally, I have gained what has been, to me, more than once, valuable experience.

THE INVENTIVE "BUG" WILL INVENT ANYTHING

The real dyed-in-the-wool inventor, the man who is thoroughly inoculated with the inventing disease, so to speak, of course knows no bound or limit. One of his schemes may deal with an automobile tire, the next with a sewing machine, the next with a steam locomotive, and the next with a telephone; and the pity of it is that all may be equally impractical.

Coming down to the coal industry, what do the patents issued cover? They cover all manner of devices—except the right ones. Mule harness, track devices, car door latches, methods of burning coal, etc., are a few of the schemes that coal men have patented, sending their specifications to *Coal Age* in the hope of obtaining publicity, fame and especially fortune.

And who are the inventors of these devices? They are stable bosses, draftsmen, surveyors, pit bosses, foremen, sub-foremen and under-officials generally. Once in a while an experienced mine superintendent patents some device or other to be used about the mine, while occasionally we receive a communication from an entirely disinterested party; that is, one not directly engaged in coal production. Thus the patent of one of the

most practical inventions that we ever received was sent us by a salesman in a retail haberdashery, or some similar emporium.

Now, the objects that men have in making inventions and improvements in existing practice may be both varied and multitudinous. Necessity or expediency beyond a doubt furnishes the inspiration for most inventions. It is easy to conceive that any man confronted with the necessity of performing a certain operation without what he considers the proper means to perform it will develop some scheme for getting the thing done, even without proper tools. Then, apparently, the thought comes to him, either from within or without, that this particular operation was never performed in exactly that way before, that it possesses certain advantages and should be patented. Here, as a rule, is where the mistake lies.

MEN TAKE OUT PATENTS FOR DIFFERENT REASONS

As a general rule, men take out patents covering their inventions for the purpose of gain—either financial gain or an increase in experience. The ambitious engineer who desires to get into the business of developing either his own or other men's ideas may well seek a patent for no other reason than the acquisition of experience in securing that patent. To him an increase in knowledge is an increase in capital, and a well-developed scheme, even though it be worthless in itself, may be a convincing argument concerning his ability when he seeks to develop the ideas of others. The average individual, on the other hand, usually protects his idea with a patent in the hope of financial gain. Probably 99 per cent. of all patents taken out are of this nature, and it is unfortunate that the person who makes the invention fails to take inventory of what gains are possible before he proceeds to apply for letters patent.

Let us here pause for a moment to consider what is and what is not patentable. Broadly speaking, any new or improved useful idea, process, apparatus or product may be legally patented. Unfortunately, patent office rules and regulations are not absolutely iron-bound, and patents are often issued upon devices that are as old as civilization itself. As an example of this, a patent was issued some years ago covering the use of a corn-cob for the removal of dirt from various surfaces. Thus, legally, any farmer who picked up a stray corn-cob in his barn or stable and used it to remove dirt from his horse's legs violated and infringed this patent. Another patent issued from the national capital covered, among other things, "a partially cooked prune as an article of commerce or consumption." Any housewife, chef or other cook who served to his or her family or guests a prune or prunes which were not thoroughly stewed, baked, boiled, fried or otherwise cooked violated this patent. These are, of course, freaks in the patent world, but they illustrate the point.

In not a few instances, also, a man will invent one thing and his attorneys patent something entirely different. Some years ago I had occasion to look up a patent (issued in a country outside of the United States)

which was supposed to cover certain improvements in apparatus for the stocking of coal, ore and similar material. I found that the inventor of the device in question had indeed invented and intended to patent a structure upon which the stocking dump car was to discharge its contents. What his attorneys had actually patented for him was the *stocking* of "coal, ore and similar granular materials."

Because an invention is patentable is by no means a reason that it should be patented. This is of course assuming that the reason for patenting is the hope of financial gain. The patent covering a device which may be perfect mechanically, which may function exactly and fulfill every claim that was made for it, might be an utter failure from the financial standpoint. It is because inventors, after they have perfected their apparatus, do not stop to take stock of what their invention will accomplish, not physically or mechanically, but financially, that so many seek and acquire patents that are not worth the paper upon which they are written.

To again draw an example from my own experience: A few years ago I hit upon a scheme to lessen degradation of coal discharged from rotary mine-car dumps. The idea was simple, comparatively inexpensive, and there appeared to be no reason whatever why it could not be made to work properly and efficiently. A short calculation, however, led me to the conclusion that, although the device was entirely patentable, it would only save a small amount upon each ton of coal handled—not sufficient to pay fixed charges on the device and a bonus, percentage or royalty to the inventor also. I therefore abandoned my first idea of patenting the scheme.

PATENT DID NOT MAKE ITS OWNERS RICH

A few years later the scheme which I had devised was patented practically in its entirety by one of the firms manufacturing apparatus for the coal-mining industry, or was patented by an individual and the patent rights acquired by this manufacturer, probably "for and in consideration of the sum of \$1 and other valuable considerations." So far as I have ever been able to learn, the holder of this patent has never reaped any large financial returns from it. If he has done so, he is welcome to them, so far as I am concerned, for it was then, and still is, my judgment that large financial gain would not be forthcoming from this invention.

In order that a patent may be of commercial value, the device which it covers must effect a saving in some major operation. A saving in labor or material on a single minor operation that goes to make up any finished product, even though that saving is comparatively large, will not yield the man who employs it any material advantage over his competitor.

Thus, let us suppose that a man has invented a means whereby the dumper on the tippie may operate the car-door lifting device from a point near the dump levers. This device may work perfectly, lift the door of every car without fail, save a large portion of the dumper's time, and eliminate the necessity of his walking from his dump lever to the front end of the car and back again twice every time a carload of coal is discharged. Such a device might be entirely patentable, yet the patent would be of small value financially because it

would save only a part of one man's time while that man was engaged on a decidedly minor operation in coal production.

Let us assume, for illustration, that the mine produces 1000 tons of coal per day, and, for the sake of argument, that the device in question saves two-fifths of the entire time of one man whose wages, we will assume, are \$5 per day. Now, it will be conceivable that this invention or device saves the operating company \$2 per day; but how much does it decrease the cost of coal per ton delivered on the railroad car? Just exactly one-fifth of one cent, which is not enough to give the mining company employing this device any decided advantage over competing coal producers.

WORKING OUT A TYPICAL CASE

Let us assume again that a device has been perfected whereby one man loading coal cars in the mine is able to put out twice as much coal in a day as he did before. Let us further assume that the total expense of operating this device amounts to 5c. per ton; also, that the wage rate for mining in the district where this machine is employed amounts to 50c. per ton. It will now be immediately apparent that assuming that the machine operator's wage per day remains the same as the average daily mining wage, this invention effects a radical and decided saving in the cost of coal. The cost has been reduced from 50c. per ton to $\frac{50}{2} + 5$, or 30c. per ton delivered on the mine car. In other words, a saving of 20c. per ton has been effected in the cost of coal, which is enough to give the mine or company employing this device a decided advantage over other mines that do not employ it. A real and measurable saving has been made.

Generally speaking, the conditions under which an invention will be a pronounced financial success are three: The device, process or apparatus invented must make an appreciable saving in the labor, material or other cost per piece or per unit of product, and the present cost, or that entailed without the device in question, per piece of product must be considerable; the demand for the article made must be wide; the number of people engaged in the production of this particular product must be large. If an invention measures up to these three conditions, it should, by all means, be protected by letters patent.

A really valuable idea should not be confided to the protection of one patent alone—it should be protected from all avenues of approach. Most articles may be produced in any one of several ways, and, in order to secure thorough and adequate protection for the inventor's idea, all methods of manufacture, so far as possible, should be protected. It is useless to lock the front door of a stable to keep out a horse thief if the windows and back door are left wide open.

If a person is to follow invention purely and solely from the standpoint of possible profit, it is well to take his inventory of possible results as early in the development of any scheme as possible. If he does not apply the financial test to his invention and trusts only to the mechanical or physical results obtained, and relying on them forges ahead through all obstacles and discouragements until he finally secures his patent from the national capital, he is not only liable but likely to dis-

cover, after he has incurred considerable expense, that he has been after all, figuratively speaking, barking up the wrong tree.

The foregoing has not been written with either the intention or desire of discouraging invention in any way whatsoever. On the contrary, the field for the exercise of inventive and creative ability was never more promising in the history of the world. What I wish to discourage is the idea that any and every new scheme is deserving of patent protection. Patents for automobile tires (so I have been told by a patent office employee whose statement I have no reason to doubt) have been issued in the United States at the rate of about two per day for several years. How many types of such tires are in general use? Are the fingers of more than one hand needed to count them? While this is possibly an extreme case, it shows that probably some thousands of patents have been issued in one particular line of invention, with only a meager few containing real merit.

Probably one of the most frequent errors made by inventors is to think of the industry served by the invention in the aggregate instead of considering a specific case. Take the example of the car-door lifter cited above. The device saves one-fifth cent per ton of coal dumped. The output of the United States is roughly 600 million tons annually. Thus the device, if applied to the entire output, would save yearly $600,000,000 \times \$0.002 = \$1,200,000$. Suppose that the inventor is a poor subforeman in a small mine. If he could realize only 1 per cent. of the total saving made possible by his scheme he would consider himself fairly rolling and wallowing in affluence. And having caught a glimpse of the pot of gold at the foot of the rainbow, he promptly proceeds to chase it, regardless of the stern fact that his pet scheme makes an infinitesimal saving in a minor operation in coal production. The golden base of the rainbow is therefore unattainable.

New French Coke-Pulling Device

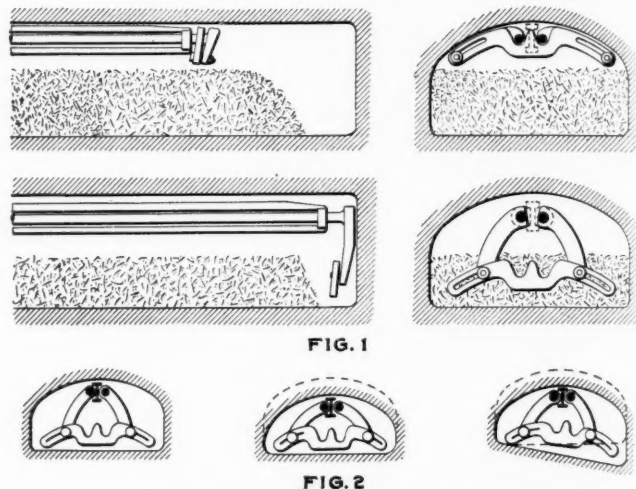
The accompanying illustrations show an ingenious coke-pulling device, described in a paper presented before a recent meeting of the Societe Technique de L'Industrie du Gaz en France. It is called the Nerriere coke discharger and is recommended especially for use in small plants.

The apparatus consists essentially of two jointed irons carried upon a horizontal piece. At the end of the two irons are two steel hooks which lie against the roof of the horizontal retort and which pivot upon two axes actuated from outside. These two hooks are connected by a steel traversing piece which is withdrawn behind the hooks when the appliance is entering the retort, and then descends behind the coke in order to pull it out.

The form and size of the different parts vary according to the lines or size of the retort. Fig. 1 shows the contrivance as adapted to retorts 10 ft. by 2 ft. 1½ in. by 14 in. The levers for manipulation lock automatically in the positions adapted for entering and withdrawal. During its action the appliance can be fixed so as to make it suit any of the cases shown in Fig. 2, of which the first is the normal condition, the second a case where the roof of the retort has been thickened by

carbon deposits and the third shows the condition when the retort has become distorted. In the latter case the iron bars settle down into a suitable position by their own weight.

There is a good deal of flexibility in the apparatus, so that it will adapt itself to retorts varying widely in form and height; it is very strong and substantially built. The supporting rod is suspended in such a way as to allow some play both horizontal and vertical; in this way the appliance can feel its way into the back of the retort, between the coke and the roof. It is



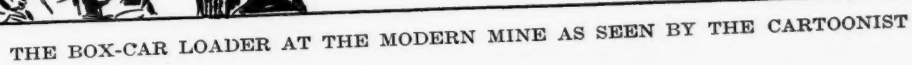
FIGS. 1 AND 2. DETAILS OF A NEW COKE-PULLING DEVICE

easy, by operating the external levers, to constrict the apparatus and enable it to be withdrawn a little in case any difficulty is encountered in its introduction.

The work required in drawing the coke is greatly reduced with this machine and small men can work it perfectly well; the time taken is also considerably reduced and the coke is brought out with very little breakage. The time taken to put in the extractor and withdraw a charge amounts only to from 30 to 45 sec. From opening the retort to closing it again, the time is reduced from, say, 3½ min. with a good detail of men, or 4 to 5 min. with a less-skilled squad, to 90 to 100 sec. in the former case, and 100 to 115 sec. in the latter case. The whole time for five retorts, including renewal of fuel in the producers, takes 15 minutes.

This appliance has been in use at St. Brieuc, and it has handled very different qualities of coal quite satisfactorily. With large charges the only difference is that the coke has to be pulled with more than one haul.

A SUGGESTION was made recently by one of the large anthracite operators that the percentage of impurities in anthracite be permitted to increase 2 per cent. above the existing standards. If this were carried out, it would mean that 1,500,000 additional tons of slate would be sent to market. To transport this increased amount of impurities to market would require about 40,000 railroad cars, necessitating from two to ten weeks for its delivery. The Bureau of Mines has estimated that the coal mined in the United States, in 1917, had an increase of 5 per cent., as an average, in the amount of ash, taken for the whole country. Also, that this increase in ash content meant an additional loss of 17½ per cent. in the efficiency of the power plant. Furthermore, in some of the mining districts there was a much higher increase in ash than is indicated by this average. As we mined and shipped 544,000,000 tons of coal in 1917, some 27,000,000 tons of this amount was inert material.



THE BOX-CAR LOADER AT THE MODERN MINE AS SEEN BY THE CARTOONIST

Report of Pittsburgh Coal Company for the Year 1918

The year 1918 was a memorable one in the coal business, with its practical immunity from serious strikes and disturbance to the price of coal. Throughout the entire year practically full control of all operations was exercised by the Fuel Administration. The warning of the previous year led to efficient coöperation by producers and consumers under Government regulation everywhere, with the result that there was no time of acute fuel shortage after the severe winter weather of the first quarter of the year. The shortage of coal during the late winter months of 1917-18 was mainly due to transportation difficulties.

The annual report of the Pittsburgh Coal Co. for the year ended Dec. 31, 1918, goes on to say that production had gradually reached full demand by the time the armistice was signed and at prices fixed by the Fuel Administration. These prices were arrived at after a thorough examination had been made as to costs of production; the final price adjustment aimed to stimulate production so as to secure the tonnage required by permitting a reasonable profit to be made in coal mining. After the signing of the armistice business gradually declined. The demand became much reduced, partly by reason of the assurance of customers that their decreased requirements would be readily met. Heavy stocks were taken in and open weather following, a general state of oversupply of bituminous coal developed at the end of the year 1918.

TOTAL TONNAGE BELOW THAT OF PRECEDING YEAR

The total tonnage produced by the Pittsburgh company in the year in question was 17,073,283 for all districts. This was a decrease of 915,932 tons under the amount mined by the company in 1917, or 5.36 per cent., and the decrease was practically all in the Pittsburgh district. The number of the Pittsburgh company's mining plants in all regions working all or part of the year were 68; three were leased, two available but idle, and one was consolidated with other workings. General conditions of transportation and labor supply made possible in any event only a 70 per cent. use of the full production capacity of the plants.

Labor supply was reduced throughout the year by reason of a number of employees going into war service, and the efficiency of those remaining was somewhat impaired by the changing of workmen from one position to another. It is to these two causes, chiefly the latter, that a greater tonnage was not realized from the mines. In the first quarter of the year car supply and movement was bad, and in the last quarter the influenza epidemic was severely felt. The report further states that the general condition of the mining plants has been fully maintained notwithstanding labor shortage, the difficulty of obtaining supplies and in the face of a steady demand for a maximum tonnage. However, this was accomplished at a greatly increased cost. One new mining plant was placed in operation during the year and another one is now under construction. No unusual purchases of property or expenditures for construction are in contemplation at present.

During the year 1918 additional coal lands were purchased by the Pittsburgh company. Some 10,085 acres were acquired, principally in the Pittsburgh district.

The mining operations of the past year exhausted 2271 acres of the company's coal lands, leaving 186,019 acres of unmined coal on Jan. 1, 1919. Of this territory 154,217 acres are in the Pittsburgh district. Referring to the production figures and the acreage exhausted in the Pittsburgh, Illinois and Hocking districts, we learn that the tonnage mined per acre by the Pittsburgh company was 7747, 5978 and 6283, respectively. It would be interesting to know the average thickness of the seams mined in each of these districts so as to get at the percentage of recovery of coal in each section. In connection with these coal lands, in compliance with the U. S. Revenue Act of 1916, the company appointed three disinterested appraisers to determine the value of such lands. This valuation is exclusive of all improvements and for the purpose of determining a basis for future depletion and taxation. Based on this appraisalment \$43,886,308 in excess of the amount heretofore carried upon the books of the company is charged to "coal lands and real estate," making a total of \$114,225,249 to this account on Dec. 31, 1918. Neglecting real estate and considering the acreage of unmined coal land at the end of 1918, this valuation would give about \$614 as the appraisalment per acre for the company's coal land.

ACTIVITIES OF EMPLOYEES' RELIEF DEPARTMENT

The activities of the Mine Employee's Relief Department have been efficiently kept up during the year under supervision of the advisory board, of which the general manager of mines of the company is chairman. To the support of this department the company has contributed only the expense of general administration since the enactment of the Pennsylvania compensation law. The workmen's compensation fund of the Pittsburgh company now amounts to \$878,996 in round figures. There were approximately 3900 personal injury accidents during the past year—an increase of 5 per cent.—all covered by compensation laws; of these 40 were fatalities, or three less than for 1917. The amount paid and adjusted to be paid on account of these accidents amounts to \$354,761. Both the company and the employees have been fortunate on the whole in that there was no catastrophic loss of life. Furthermore, the injuries to the workmen were of a lighter average grade than customary. However, the work has demanded a heavy toll even under the safety provisions required by law.

The pension fund of this company now amounts to \$212,994.36, of which \$189,409.98 is invested in the preferred stock of the Pittsburgh Coal Co. and in United States Government bonds. During the year 1918, 27 names were added to this roll; 17 have died and there are now 110 pensioners. It is natural that this fund should develop a strong bond of mutual interest between the company and its employees. The report states that enlargement of the present pension basis is under consideration. Another activity administered at this company's expense is the Employee's Association. Through this agency the employees have subscribed, paid for and have had delivered to them 5272 shares of preferred and 3476 shares of common stock of the Pittsburgh Coal Co. Moreover, there are now under subscription 9658 shares of preferred and 7303 shares of common stock, or a total of 25,709 shares of both classes. Thus this association has been the means of promoting thrift and of delivering a good investment to the employees on easy terms and at reasonable average cost.

News From the Capitol

By Paul Houston



Railroad Fuel Policies Too General Say Coal Operators

In putting into effect the coal policies recently outlined by Director General Hines of the Railroad Administration, instructions have been issued to regional directors which are regarded by coal operators as being entirely too general. These instructions were issued by Henry B. Spencer, who is in charge of the division of purchases of the Railroad Administration. They contain no specific order of procedure. This is regarded by coal producers as necessary to the working out of reforms which are essential to the best interests of all concerned. The Railroad Administration is quick to admit that wages should be maintained at existing levels, but it apparently is reluctant to put into effect conditions which will permit of the operation of the maximum number of mines which furnish employment.

Coal men call attention to the fact that there has been a very gratifying display of good intentions on the part of the Railroad Administration, but the thing most needed just at this time is practical procedure. They are clamoring to know what is meant by "bids." What form are they to take? For what period are they to extend?

Very recent procedure indicates that the price of the lowest bidder is being accepted and then other operators are being called in and offered contracts if they will meet the low man's price. This is held to be entirely contrary to the spirit of the Director General's recent statement. The instructions issued by Mr. Spencer, referred to above, follow in their entirety:

1. The railroads must not violate existing contracts or cancel contracts where the quality of coal is in accordance with specifications, without special consideration by the Central Advisory Purchasing Committee of the reasons for cancelling.

2. The purchasing agent of each individual railroad shall buy the coal for that road under the supervision of the Regional Purchasing Committee of his region. In all requests for bids, the following paragraph should be inserted:

"It is distinctly understood that all bids are to be based on existing rates of pay for all mine labor, and the price will be subject to readjustment in event existing rates of pay are changed."

On contracts awarded or orders placed, the following paragraph should be inserted:

"It is distinctly understood that the prices named herein are based on existing rates of pay for all mine labor and the prices will be subject to readjustment in event existing rates of pay are changed."

3. For coal purchased hereafter, the purchasing agent of each road shall request bids in accordance with paragraph 2. In considering these bids or making recommendations to the Regional Purchasing Committee for contracts, roads

must take into consideration the desire of the Director General to make as wide a distribution of the tonnage bought as conditions will permit considering quality, transportation and price, at the same time confining so far as practicable purchases to producers on the individual roads. The purchasing agent should not offer any price to producers and must stipulate that any price named must be based on existing pay for mine labor. He reserves the right to reject any or all bids.

4. The Director General has directed that prices and names of contractors will be available to accredited representatives of the miners or producers who may request the information after contracts are closed. Prices or bids which are not accepted need not be disclosed.

5. Contracts may be made for a period not exceeding one year, subject to cancellation upon 30 days' notice in writing by either party. If in the judgment of the Regional Director it is desirable, the clause requiring 30 days' notice of cancellation may be waived.

6. All contracts for fuel shall contain the following:

"The contractor expressly warrants that he has employed no third person to solicit or obtain this contract in his behalf, or to cause or procure the same to be obtained upon compensation in any way contingent, in whole or in part, upon such procurement; and that he has not paid, or promised to pay to any third person, in consideration of such procurement, or in compensation for such services in connection therewith, any brokerage, commission or percentage upon the amount receivable by him hereunder; and that he has not, in estimating the contract price demanded by him, included any sum by reason of any such brokerage, commission or percentage, and that all monies payable to him hereunder are free from obligation to any other person for services rendered, or supposed to have been rendered, in the procurement of this contract. He further agrees that any breach of this warranty shall constitute adequate cause for the annulment of this contract by the United States, and that the United States may retain to its own use from any sums due or to become due thereunder an amount equal to any brokerage, commission or percentage so paid, or agreed to be paid.

"This agreement of the Director General of Railroads shall not extend beyond the period of Federal Control of Railroads, and unless sooner terminated, shall as to him, terminate at the end of such Federal control."

Fuel Administration Again Urges Consumers to Buy Coal Early

That the public must buy coal early for next winter's needs is urged in an announcement by the Fuel Administration made on Mar. 20. The administration is alarmed at the tremendous decline in production and the accompanying lack of buying. It points out that stocks of coal are rapidly being consumed and that ample provision must be made during the spring and summer, if congestion in coal transportation next fall and distressing shortages are to be avoided.

Urges Continued Governmental Co-operation with Coal Industry

Acting on the assumption that the coal industry is convinced that coöperation with the Government during the war resulted in certain benefits to all concerned, Fuel Administrator Harry A. Garfield suggests that it may be desirable to continue a modified form of co-operation. In order that the views of coal producers may be set forth systematically, Dr. Garfield has requested the National Coal Association to submit the question in referendum form to its membership. The mailing of the proposals to the members of the National Coal Association began Mar. 20. It is believed that practically complete returns will be had by the end of the first week in April. Thus it will be possible to have the consensus of the opinion of the producers of 400,000,000 tons of coal, or three-fourths of the country's annual production. Deductions from the returns will be available for consideration by the directors of the National Coal Association when they meet at Cleveland Apr. 4.

PLAN PROPOSED BY DR. GARFIELD

In addition to price, the plan goes into various ramifications with the idea of promoting the welfare of all interested. In brief, the plan proposes:

First, that all facts relating to the industry or any question touching it, such as the cost of living, the cost of production, labor conditions, transportation facilities and other factors entering into the cost of coal be officially and accurately ascertained by some of the regular Government agencies, since the Government is the most appropriate representative of the public.

Second, that the public is one of the parties at interest, the other two being capital and labor, and that no action affecting any of the findings of fact be taken until all three parties, through their duly qualified representatives, shall have had an opportunity to consider and discuss the proposals.

Third, that the determination of facts, as outlined, and the formulation of administrative policy are two separate and distinct functions and therefore should not be performed by the same agency of the Government.

Fourth, that the findings of facts, thus proposed, should be submitted to a permanent department or commission of the Government. In this connection it is pointed out that the plan does not contemplate the creation of new agencies, but proposes to utilize existing permanent Governmental organizations.

Fifth, that the President designate some cabinet officer, or other appropriate official, to represent the public in considering any policy proposed, and that as advisers to the commissioner there should be an equal number, say three, of representatives of operators and miners. The function of the commission would be the consideration of all problems affecting the industry, and the formulation of policies to deal with such problems, the commission being a purely advisory body.

Sixth, that the commission shall make recommendations to the President, who would thus be placed in close relation with the industry and all factors entering into it, making for its prosperity or retarding its development.

"Such a plan," says the Fuel Administration, "modified to suit diverse conditions, it is conceivable, might be adopted not only by the coal industry, but by other basic industries of the country as well, in which event the Government would be placed in possession of intimate facts, figures and findings, and recommendations in meeting industrial problems relating to any industry as such problems might arise. It does not conflict with the work now being carried forward by the Industrial Board of the Department of Commerce."

Conference Will Discuss Business Side of Engineering Education

Convinced that insufficient attention is being given to business training in the engineering courses of the higher institutions of learning, the Commissioner of Education of the United States is conferring with representatives of these institutions. In these conferences, the Commissioner of Education is being represented by Dr. G. L. Swiggett, the specialist in charge of commercial education for the Bureau of Education. Dr. Swiggett was the secretary in charge of the second Pan American Scientific Conference, which was held in Washington in 1915.

The matter first was called to the attention of a small group of administrative professors of engineering and commerce from several of the institutions in the Middle West. There was such unanimity of opinion that the average engineer is leaving college with insufficient business training that it was decided to hold a larger conference in Washington Mar. 31. At this conference it is hoped to formulate certain plans as to curricula which it is hoped the various colleges and universities will see fit to adopt.

Since it is expected that the United States will take a far more active interest in projects in other countries calling for engineering skill, it is the opinion of Dr. Swiggett that the requirements for that purpose alone would justify greater attention to the business side of engineering education.

The conference on Mar. 31 also will be attended by representatives of the leading four national engineering societies and of the Society for the Promotion of Engineering Education. The conference is to be of an executive nature.

Coal 44 Per Cent. Higher Than in 1913

Since January, 1913, Pennsylvania white ash coal has advanced 44 per cent., chestnut 42 per cent., and bituminous 44 per cent., according to an article in the March number of the *Monthly Labor Review*, issued by the U. S. Bureau of Labor Statistics of the Department of Labor. The first big jump in the price of all kinds of coal came in the year from Jan. 15, 1917, to Jan. 15, 1918. From Jan. 15, 1918, to Jan. 15, 1919, stove coal increased in price 17 per cent.; chestnut, 16 per cent.; and bituminous, 3 per cent.

A surplus of coal cars throughout the central western region is reported by Hale Holden, regional director for the Railroad Administration.

William B. Symmes, Jr., solicitor of the Fuel Administration, has tendered his resignation to Dr. Garfield. It is effective Mar. 31 and has been accepted. Mr. Symmes will return to the practice of law in New York City.

A study of the prices of coal and coke during the war has been prepared by C. E. Leshner, the geologist in charge of coal statistics for the Fuel Administration. It will be a part of a work on the history of prices of various commodities being prepared by Prof. Leslie C. Mitchell, of the War Industries Board. Mr. Leshner's contribution records the fluctuation in prices of coal and coke from 1913 to 1918. It is accompanied by a large number of diagrams.

EDITORIALS

The Question of Wages

THROUGHOUT the world the economic pot is boiling. It is inconceivable that out of the turmoil no good will come. Already lessons are being learned and great truths are becoming more apparent. In Russia we see the results attending a government controlled by radical socialists. Here in America we are furnished with an example of government ownership in the Federal control of our railroads. We find that the experience of Great Britain is duplicated here, and the railways are run at a big loss. It is also true that the railway deficit has occurred in spite of record receipts.

All of this furnishes food for thought and leads to the conclusion that something is radically wrong. People are commencing to discover that rewards of industry are not fair on the part of either capital or labor when obtained by force. When wages are increased through compulsion, they are nearly always disproportionate to other awards of the same class. There is also a growing feeling that there is a limit to the ability of taxpayers to pay wages that are raised without reason or restraint.

In many industries workmen are maintaining that profits are unnecessary. Only disaster can follow in the wake of such a belief. Profits are the pay of management that produces wages. When profits disappear, work must stop, or wages must be paid by taxpayers.

The time has arrived when employees must acknowledge that when costs are increased above the worth of the product produced, ruin is sure to follow. Nothing is more unsound than the belief that wages and profits are antagonistic, for not only is this untrue, but it is an economic fact that profits and wages always rise and fall together if basic industrial conditions are healthy.

Perhaps the most outstanding truth we have learned is that even excessive wages fail to satisfy those who receive them. There can be neither peace nor industrial progress until both capital and labor learn once for all that justice cannot prevail in a system where either the employer or the employee is permitted to fix his own price in a market controlled by force.

If any one takes you for a sucker and tries to exchange your honest-to-goodness Liberty Bonds for worthless stocks (oil, mine, railroad or other) kindly send the literature he hands you to the Federal Trade Commission at Washington, D. C. The Capital Issues Committee is trying to expose all individuals who are seeking to sell blue sky to the public in exchange for Government securities, and it will appreciate as a patriotic act your assistance in showing the rascals up.

Jacob Is in No Need of a Father

AS WAS said at the recent session of the American Institute of Mining and Metallurgical Engineers, the Governmental control of the anthracite industry proved to the hilt the dangers of Federal regulation. The price of hard coal was made so low that large numbers of substantial operating concerns would have

been compelled to close down if the control had continued, unless of course the price set by the Administrator was increased.

The Administrator himself, while not admitting that he had fixed an unjust price to satisfy a grumbling public and to help the persons in power, did admit that the price was too low and that he would have had to raise it himself if the regulation had been continued. Seeing that Dr. H. A. Garfield, like most war controllers, was disposed to be reasonable, his failure to do justice to a large number of anthracite operators exhibits clearly the dangers of Federal control.

Control in general is based on two principles. The first is that the profits made by the least favored of the controlled shall not exceed a certain per cent. This is not a bad feature, and it is one that is openly avowed. The second is a scandalously vicious one, yet every controller seems to believe in it heartily. It is this: Having discovered what price will possibly render a certain profit, let that price be granted; if there are any mistakes, let the industry stand for them.

It appears that the increase in price, when one is granted, is so fixed that it almost always fails to meet increases in cost of operation. The controller is so sternly bound that the controlled shall not make an excessive profit, that he casts out, when he makes the price, all possible contingencies of raise of costs and anticipates all kinds of contingencies that will lessen cost. It is as if an engineer, having made a reasonable estimate, has it reduced, by authority, 10 per cent. instead of having it, as is usual, increased 10 per cent. to cover unforeseen expenditures.

Seeing that large parts of the anthracite industry did not get justice from Dr. Garfield, to whom then could it look? Certainly not to such a body as the Interstate Commerce Commission, which as an organization was rather for closing down the railroads than for providing for their reasonable control. The trouble is that, like Mr. Micawber, it was always looking for "something to turn up." This "something" was expected to relieve the situation without any rise in rates.

The United States Railroad Administration was just as remiss in its sizing up of the situation. It did not reckon on business falling off with the end of the war; it did not consider that the railroads it had taken over had managed to exist solely by letting the roadbeds and equipment deteriorate from day to day; it did not think that the soldier boys would be back looking for jobs. What is the real situation? Business has collapsed and the railroads have no traffic. There are a quarter million more employees than before to be paid, and more are coming from the ranks of the army and navy.

In consequence, the freight rates are found to have been raised an inadequate amount. Nevertheless, when the country's governors and mayors met at a conference recently, they demanded among other things that freight rates be lowered. That was their contribution toward solving the problem—lower freight rates for building and road-making materials.

Control is, and always will be, made on the basis of letting the industry stand for all the mistakes of the estimator. It will be fortunate if that estimator will be wise enough to face half the contingent expenses of production, in spite of public clamor, to say nothing of those which are remote and indeterminable. If he does show such wisdom, however, he will be summarily removed. The public can no more be trusted to set a fair price on the goods it consumes in quantity than a father can be suffered to serve on a jury before which his son is arraigned. The public is an interested party and acts accordingly. No industry in the present state of enlightenment can safely submit its direction to such a court.

Nevertheless, there are rumors that the work of the Fuel Administration is to be perpetuated in the future. The Geological Survey is to take over the statistical work of the defunct Fuel Administration, the Bureau of Mines is to take over the problems of conservation, and it is said it would now like to take over cost accounting, mine inspection and the procurement of clean coal. The Department of Commerce, it is said, is scheduled to allocate and distribute coal and fix the price for it as far as the Administration decides that the price ought to be fixed. The Department of Labor also wants a hand in the regulation, not to speak of the Federal Trade Commission. The coal industry will not lack for stepfathers. It is a husky lad, and one to whom anyone would rejoice to be father, for there is a profit in acting as its common-law guardian.

No profession has a smaller equipment of cost data than the coal-mining profession. The metal-mining fraternity is vastly less reticent than the members of the coal-mining industry, where little has been recorded as to production costs or even as to depreciation and the expenses of construction. The latter, surely, are not forbidden subjects. When will coal-mining engineers be as liberal with their data as are the metal-mining engineers, the civil engineers, contractors and railroad engineers, who have lately done remarkable work in cost accounting?

Financial Backing for the Export Trade

THERE is a growing feeling that the Government must take an active part in supporting the banking interests that are promoting our export trade. Not only is this necessary from a material standpoint, but also for the moral effect it will have. There is further the humanitarian phase in that American capital is a tremendous factor in rehabilitating and restoring the devastated countries of Europe. To be effective this assistance must be of a permanent character; the exporter must feel that his business arrangements are not going to be subject to the periodical changes in the political situation.

One of the first problems confronting the Government will be to provide some means for absorbing the enormous trade balance which this country is piling up in favor of itself. For instance, our January exports amounted to 623 million dollars as compared with only 215 million dollars' worth of imports. Banking authorities are agreed that this is a fundamentally unsound condition, and impossible in normal trade. The coal producer obviously will not be interested in the foreign markets unless he sees definite prospects of something other than credits to be obtained.

It is interesting in this connection to note how the British Government reacted to a feeling of this kind as expressed by the business interests in England a few years ago. The Government immediately established a bank under the name of the Trade Corporation, which was employed to promote and finance business undertakings of any kind in addition to entering into foreign trade itself. This was a radical departure for the old-line banker, who had always been ultra-conservative in the matter of actually entering into trade.

The Corporation so far seems to have confined its activities to financing larger propositions, such as the Portuguese Trade Corporation, whose chief object is to supersede German interests in Portugal. Of more interest, however, to American exporters is the formation of the Anglo-Brazilian Commercial and Agency Co., which the Trade Corporation effected in conjunction with the London and Brazilian bank. The primary purpose of this organization is the promotion and protection of British trade in South America. In Brazilian trade, the Corporation officials complain of a serious trouble, which American exporters have also encountered; namely, the difficulty of obtaining the right kind of men to promote activities in that country.

One of the recognized functions of the Corporation will be its authority to act as a fiscal agent; thus it has already made an industrial issue involving a half a million of debentures to the Morgan Crucible Co., all of which were readily subscribed to. Its activities are of course seriously handicapped by blockade restrictions of various kinds, and the general demoralization in the world's trade, but the Corporation is in no way slowing down in its efforts.

The attitude of the British Government was well summarized in a statement by a prominent Government official made before the British Parliament a number of years ago as follows:

"The Foreign Office and the Colonial Office are chiefly engaged in finding new markets and in defending old ones. The War Office and the Admiralty mostly are occupied in preparing for the defense of these markets and for the protection of our commerce. Therefore, it is not too much to say that commerce is the greatest of all political interests and that that Government deserves most popular approval which does the most to increase our trade and to settle it on a firm foundation."

It is to be sincerely hoped that our own Government will take cognizance of the sentiment expressed in the last sentence of that statement and promulgate a no less helpful attitude toward the prospective exporters in this country. Our exporters must have powerful financial resources behind them to assure their being able to compete on a favorable basis with our British rivals.

Too readily we assume that the eyes of brain workers are vastly inferior to those of manual laborers, and that this explains why so many of the former workers are bespectacled. It may be granted that the brain worker's eyes have, in many cases, been injured by the strain of reading; but much eye trouble is congenital and, as such, will be found equally prevalent among manual laborers and brain workers. Many accidents would be spared doubtless if the mine worker would be morally brave enough not to resent cries of "Four eyes," "Goggle eyes," and "Quatr' Occhi," but wear the spectacles that his imperfect eyes demand. An inquiry is needed into the ocular efficiency of the mine worker.

THE LABOR SITUATION

EDITED BY R. DAWSON HALL

General Labor Review

Those who wait to buy coal are creating an anarchy for which they will undoubtedly have to pay and pay dearly, at least in money, if not in commodities more valuable. The mine workers now laid idle are meditating all kinds of industrial reconstruction, none of their schemes being likely to decrease the cost of coal but rather to increase it. When the public resumes buying, it may find that many fateful things have happened which will make coal a dearer article than they thought. American coal is cheap today because American labor has not demanded European restrictions. But every day makes it more apparent that the American mine worker (or rather the mine worker in America), Canada by no means excepted, looks upon Great Britain's uneconomic labor-union rules as helpful to the workers in the industry. The workman is wrong. European restrictions are suicidal, but who can convince the mine worker of that fact?

Shortness of work has made him advocate the 6-hr. day and 5-day week with wages adjusted so that the day worker in the mines will receive more for 30 hours of work than he did for 48 hours during the war. That is 60 per cent. more per hour or unit of accomplishment. If the day worker in the mines gets it the public will pay 60 per cent. more per ton for his labor, quite a noticeable increase. Secondly, the mine worker is anxious to arrange for the operation of all mines, profitable as well as unprofitable. That will prevent offsetting by economies in production any of the wage increase and working-time decrease now demanded.

PUBLIC WILL PAY DEARLY FOR WAITING

Worse yet, we find the mine worker wanting Government ownership, which is another way of raising costs of production. If the purchaser of coal does not get busy the cost of coal will be raised immensely. The increase just announced by the anthracite operators will be seen to be futilely small, mere playing with conditions, should the mine workers decide to violate their contracts and make the anthracite operator also pay what they are proposing already for the bituminous operators.

The recent adventures in Government ownership have been utter failures. In Great Britain 50 per cent. was added to freight rates and every restriction of accommodation imaginable was put in force. The public was systematically milked by the British Government, but despite this and in spite of coöperation in railroad work such as was highly illegal here before the war, the Government could not make the railroads pay.

In the United States the Government operation of railroads is highly unprofitable. The wage increases do not represent all the increases in operation. There are other increases in operating cost of at least equal size which have arisen largely, though not solely, from Government mismanagement. This is despite the savings resulting from a coöperation which for privately-owned railroads would be a violation of the Sherman law.

In a similar way the nationalization now being discussed by the miners would put a new burden on the public. The delay in reconstruction, the greed of the buyer and his gullibility are about to levy on him a tribute under which he will groan increasingly year by year. We pay dearly for uncertainty. The Peace Conference gets nowhere in Paris, and Bolshevism grows. The buyers of America also get nowhere, fed up by promises of lower prices by the price reductionists, and meanwhile Socialism grows—short hours, nationalization of mines and bigger wages for shorter time. The Republic should wake up for Rome is most certainly burning.

Closing of Mines Causes Trouble

Despite the fact that during the war the miners of Centralia were among the most loyal in the anthracite coal fields, responding to every appeal to support the Government in all war activities, Centralia Colliery has been idle for the past five weeks. The miners and citizens of Centralia, believing that they deserve better treatment, have adopted resolutions as follows:

"Whereas, the Lehigh Valley Coal Co. shut down the Centralia Colliery on Feb. 7, 1919, leaving all the men in the town of Centralia without employment, there being only one colliery in the town for a population of about three thousand of people, and, whereas, during the recent crisis the people of Centralia were as loyal as any in the country; and the town of Centralia sent more men to the army and navy than any other town of its size in the state and the town went over the top with all Liberty Loans and Welfare drives, and, whereas, the miners of Centralia made many sacrifices, working holy days and holidays during the war and during the year 1917, the breaker working 16 hours a day for a period of time, in fact as long as the breaker was in a condition to do so.

UNION CONDEMNS CLOSING UNPROFITABLE MINES

"Therefore, be it resolved that we condemn the action of the Lehigh Valley Coal Co. in closing down the mines of Centralia, leaving the people without employment, as there is no other industry in the town, and also condemn the business men of Centralia for their indifference at this time, an indifference that is inconsistent because in the past they interfered in the troubles of the miner's local, using their influence to get the miners to work whether they got justice or not, and be it further resolved that we request an investigation by the Federal Department of Labor as to the cause of the idleness of these mines of the Lehigh Valley Coal Co."

The grievance committee of the Delaware, Lackawanna & Western R.R., Coal Department, employees, has requested that a speedy effort be made to give all the employees of the Continental and Brisbin Collieries work in other mines. The officials of the company promised to adjust this trouble as soon as possible.

SALARIED MEN MUST LAY OFF AS OFTEN AS REST

The mine workers of the same company complain that salaried men have been permitted to work on days which have been officially declared idle, and thus some men have been receiving more pay than others. The men also request that consideration miners be continued on that basis until an equitable contract can be mutually agreed upon. They urge that an earnest effort be made to secure such an agreement. The officials declare themselves desirous of reaching, without delay, an agreement satisfactory to both employer and employee.

Representatives of the employees also asked that where contract miners have been working on a consideration basis under abnormal conditions they be continued at work on said basis until conditions again become normal. The officials agreed to go along for a period of ninety more days on a consideration basis. Another meeting between the officials and mine workers will be held, at which time it is hoped an amicable adjustment will be made.

Announcement was made on March 18 that the check-off which anthracite miners have sought for years as a concession from the operators will again come up when the two bodies send their representatives to confer on the wage scale for a term of years starting Apr. 1, 1920, which is the date at which the present contract expires.

The check-off, which permits the union to collect its dues at the pay office through deduction from miners' wages, is in effect in many parts of the soft-coal fields, but its introduction into the anthracite region has thus far been resisted by the operators.

Anthracite coal miners are content to let the question of coal prices rest with the federal fuel administration, but they are vitally concerned over maintenance of their present wages, according to a statement given out on Mar. 17 by Thomas Kennedy, president of the Lehigh District, who said that every effort would be put forth to retain the current scale and, if possible, to get concessions improving living and working conditions.

West Virginia Elects Not To Enforce Laws

What amounts to a death blow was dealt the State Police patrol bill in the House of Delegates on Tuesday afternoon, Mar. 18, when, by a vote of 42 to 41, the measure was tabled. Chief opposition to the measure came from the United Mine Workers and other labor organizations and from two state officials—W. S. Hallanan, Tax Commissioner, and S. B. Montgomery, State Labor Commissioner, Republicans, who in alliance with the labor element have fought the bill on political grounds. The police bill as proposed had been endorsed specifically by a number of coal operators' associations, including the Smokeless Coal Operators' Association, whose membership represents a West Virginia production of 35,000,000 tons annually. Governor Cornwell had urged favorable action on the bill as a means of protecting the lives and property of the people of the state from the Bolsheviks, anarchists and I. W. W. and within a day or so after his message was sent to the legislature, miners at Wendall in Taylor County after threatening the Governor and legislature with violence attempted to hold a "red-flag" parade as a protest against the enactment of any legislation which would provide police protection to replace that hitherto given by the national guard.

After the Ramage resolution threatening revolution in case the police bill was enacted into law had been adopted by about 20 other miners' unions in the state, F. C. Keeney, President of District 17, U. M. W. of A., issued a statement saying that the Ramage local had no authority to adopt such a resolution because it was an open declaration of violence and as such in conflict with the laws and policies of the United Mine Workers' organization. Federal agents have had the authors of the Ramage resolution under investigation and this prompted Keeney to say that the authors of such a resolution need look for no protection from the national body.

Trouble is expected in several of the districts of the state before the summer is out, not from the native element, but from the foreigners who have become inoculated with Bolshevism.

Illinois Agitates for Shorter Hours

Illinois miners have taken up with acclaim the suggestion of State President Frank Farrington that a demand be made for a 6-hour day and a 5-day week. It is the principal subject of discussion at all the meetings of locals and at all district conventions now being held. The line of reasoning is this: There is not enough work now to give the miners employment more than two or three days a week, therefore the hours of labor should be reduced without reducing the day wage. This would increase the regularity of employment and consequently make the earnings of day men equal to those earned during the war.

The way that the operators will probably solve it will be by the simple and direct method of refusing the demand. They are determined to fight the 6-hour day. They declare that they cannot grant the demand and survive and charge that the 6-hour day is a scheme to bring about Government control if not Government ownership. One item which would add enormously to the expense of production would be the necessity of employing four shifts in the 24 hours of

the full day for such laborers as are needed to keep the plant in operation. Of course, this does not apply to the diggers.

The 6-hour day was the principal subject of discussion at the recent convention of Subdistrict No. 7, which was in session three days of the past week at Collinsville, Ill. The principal speaker was John Walker, president of the Illinois Federation of Labor. He and others urged upon the 100 delegates that the only solution of the problem of providing employment for the miners of the district under present conditions is the 6-hour day. Impetus was also given to the coöperative store movement.

The proposition has received some attention at recent joint conferences of operators and union representatives. The latter have been given to understand that the proposed reduction of working hours will not be entertained for a moment, unless the same conditions are enforced in competing states. They have pointed out that the enforcing of such a measure in Illinois would not produce a better condition than at present but on the other hand would make matters worse for the Illinois operators, because it would give the mine workers of other states an advantage over the Illinois mine workers. The union officials have admitted the correctness of this contention.

SHORT DAY CANNOT BE MADE LOCALLY EFFECTIVE

President Farrington has even gone so far as to send out a circular letter to the officers and members of District No. 12, who were planning to call a district convention in the interest of the 6-hour day, pointing out to them that such action would be useless, as it would mean that the cost of production in Illinois would be much higher than that of competing districts and would result in little or no work for the Illinois miners. Farrington's letter is as follows:

"Recently a number of resolutions have reached the district office asking that a special district convention be convened to take up the matter of securing a shorter workday.

"As stated in my circular of Feb. 21, I am convinced that we will get no substantial relief until our hours of labor are decreased. Conditions demand a 6-hour work day, 5 days per week, for all the mine workers of the country, with no double shift work on the coal allowed except as necessity may require, and development for increased tonnage should not be regarded as being a necessity. We must wage an aggressive, uncompromising, organized fight to attain that end. Nothing short of that will bring the needed relief. To achieve this reform is vital and paramount and the full strength of our union should be used to attain that end. Other things are secondary, nothing less will do.

"The over-development that obtains in the mining industry of the United States is a waste of capital, of labor and of natural resources, and is an economic crime that would not be tolerated by any other country in the world. The evil of it reaches into the lives and the homes of all of the hundreds of thousands of mine workers in America; it is ever present to make impossible their security, to blight their happiness and to prevent their prosperity. It is so fundamentally wrong that justice demands its correction. No make-shift expedient devised to carry us through the period of reconstruction will do. The remedy must be lasting and true.

TWO HOURS CANNOT BE TAKEN OUT OF PROFITS

"However, the matter of securing a shorter workday is too big and too far-reaching in effect to be disposed of by action of a district convention. It must be obvious to all that a district convention could not secure a shorter workday for all the mine workers of the country and that it would be useless to attempt to shorten the hours of labor in Illinois without regard to the hours worked by mine workers elsewhere, as to do so with the present over-development in the mining industry would mean, should we succeed, that the cost of production in Illinois would be so much higher than that of competing districts that Illinois coal could not be marketed and we would get little, if any, work at all. Thus it is that the matter is not one to be handled by a district convention. But you may be certain

that the matter will have attention and that a definite line of action will be devised when your policy committee, which is to assemble at President Hayes' request, meets in Indianapolis on Mar. 18."

The Fifth District, in convention at Taylorville, Ill., adopted a resolution in favor of organizing a labor party. The 6-hour day and 5-day week were approved. The anti-injunction and the state constabulary bills were denounced and officers and members were urged to work for their defeat.

The policy committee of the United Mine Workers assembled at Indianapolis, Ind., has accepted the 6-hour day and added thereto the 5-day-week, an increase in tonnage rates, day wages, deadwork and yardage and nationalization of mines. The increases to be demanded were at last advices still being discussed.

British Miners Threaten Strike

While there is perhaps not the same organic unity in Great Britain among the miners that there is in America, there is a unity of aims, and, what is more, there is a triple alliance of mine workers, railroad and transport workers, an organization formed to make the taxpayers who do not belong to this widely extended union pay them an unreasonable wage and grant them unusual privileges. If that concession is not granted, England and Scotland will sit still and starve.

It is not therefore a comfortable situation in which the taxpayers of Great Britain find themselves. The people must conciliate the Mighty Three or many persons will starve to death. Some years ago there was a big strike of this kind and some people not interested at all in it starved rather than ask for alms. This threatened strike may not come off. It is said that the Government "for the first time shows an inclination to meet the miners and railway men fairly instead of haggling over each point." That is to say, the Government is weakening under pressure. It is going to desert the unmarshaled majority for the marshaled minority.

The trouble started long ago. It is hard to set a date, for the mine workers and railroad men have been chronically discontent. They had a grievance which would stand some inspection. During the stress of war wages had gone up a little less than cost of living—the difference was pitifully small as a basis for a national strike, only 115 per cent. increase in cost of living against an advance of 106 per cent. in wages. The Government was perfectly willing, as were also the operators, to grant that, or even a larger increase than any that the increased cost of living made reasonable.

The miners first voted that they would stop work on Mar. 15, a ballot being sent out to the different districts of the Miners' Federation. In order to expedite matters, the Executive decided that each district print the necessary ballot papers. Speedy taking and counting of the vote was necessary. The union figured that haste would express determination and paralyze those who would otherwise oppose the attempt to shut down British industry or impose on the taxpayers an unequal burden in favor of the Mighty Three. The ballot-paper was quite simple in form and was as follows:

MINERS' FEDERATION OF GREAT BRITAIN.

Ballot of Members.

1. Application for 30 per cent. increase in wages.
2. Six hours day.
3. Full maintenance at trade union rates of wages for miners unemployed through demobilization.
4. Nationalization of mines.

The Government having failed to grant any of the above proposals, Are you in favor of a National Strike to secure them?

Yes.....

No.....

Please place an X opposite Yes or No in the space provided for the purpose.

Frank Hodges, Secretary

In their deliberations at the Southport Conference the

Executives were not satisfied merely to recommend the ballot. In their resolution they said, "We further strongly urge all members to vote in favor of a national stoppage until our demands are conceded."

The vote favored a strike and great was the consternation which followed. Never in living memory had local stocks been so small. When the strike was approved by vote Londoners were forming queues to purchase 50-lb. bags of coal with which to mitigate as best they could the bleak coldness of their homes. True, spring was near at hand and the householder could rely on the sun not to join the Triple Alliance, but even this was no consideration at all to those workers who were dependent on the coal for their livelihood.

The decision of the miners was followed by the railroad men and transport workers. Even since 1914 they have planned a concerted attack on those who were not employed with them in their industry, but the war delayed matters. There were even bigger things on hand. Now that the war is over the program is again taken up.

A Coal Commission was formed some time ago to find out a solution. The majority of the commission has found one and has returned an interim report of date Mar. 20. The operators were making too much money according to the findings. Possibly the commission was right in this contention, as the Government is still proposing to let the operator make a profit of 28c. a long ton or 25c. a short ton. The Government, according to Bonar Law's statement in the House of Commons, will reduce the operators' profits 13,000,000 pounds or \$65,000,000 per year.

But that will not pay the increase in wages proposed during the current year, which is 43,000,000 pounds or \$215,000,000 a year. The balance of 30,000,000 pounds or \$150,000,000 will apparently come out of the pockets of the taxpayers. But they need not worry about that, for in 1921 it will be much more. Just as the Government of Great Britain has bought dear wheat in the United States and sold it cheap at home at the loss of the taxpayer, so it will by subsidy or purchase put up wages and yet keep down the price of coal.

It must not be considered that the Sankey Commission, so called because Justice Sir John Sankey is chairman, was unanimous. There were three reports. The principal one recommended that underground the hours of work should be limited to seven, instead of eight. This provision would come into effect July 16 of this year. On July 13, 1921, the duration of underground work would be reduced to six hours, if the economic position of the industry warranted it. Bonar Law in the House of Commons explained this, saying that in 1913 the output was 287,000,000 long tons. It was expected that it would be possible by July, 1921, to get the same tonnage, working only two-thirds of the time.

The wage increase proposed is not large, being two shillings, or 48.7c., per shift for those colliery workers now under sliding scales and an advance of one shilling, or 24.35c., per shift for workers under 16 years. The committee favored giving the mine workers an effective voice in the direction of the mines. The present system of ownership and the existing manner of operation is condemned, and the commission advocates some substitute, either nationalization or unification by national purchase and joint control. The report declares that one penny, or 2c., per long ton should be collected at once on all coal brought to the surface. This penny is to form a housing fund for improving the dwellings in the colliery districts. It seems a small amount, but it will bring in about a million pounds, or five million dollars, annually.

Sankey's report is signed by Arthur J. Balfour, Sir Arthur Duckham, Director of Aircraft Production, and Sir Thomas Royden, member of the Shipping Control Committee. It seems to concede everything within the scope of the imagination, but it does not please the miners' representatives led by Robert Smillie, who is the miners' leader; Frank Hedges, Sir Leo Chiozza Money, Sidney Webb and others who in their report recommend acceptance of the miners' demands in full, including nationalization of mines. The miners, it may be recalled, ask for a 30 per cent. increase. The operators' representatives favored a 36c. advance per shift and a 7-hour day.

DISCUSSION BY READERS

EDITED BY JAMES T. BEARD

Utilizing Mine Gas to Save Fuel

Letter No. 2—I was very much interested in the letter of W. D. Owens, *Coal Age*, Feb. 20, p. 372, which was reproduced, a little later, in the Wilkes-Barre Record, one of the leading newspapers in the upper anthracite valley. Mr. Owens' article related to the utilization of methane gas for steam-raising purposes, and was based on the recent experiments that have been taking place at the Loomis colliery of the Delaware, Lackawanna & Western Coal Co., near Wilkes-Barre.

Every new venture will surely bring its difficulties, which require careful study and watchfulness to overcome. But let us hope that none of the dangers to which Mr. Owens has drawn attention will ever be realized in the undertaking now at hand. As in many other large enterprises—the Panama Canal or the New York Subway, for instance—so here man's ingenuity will eventually prove successful and master the problem of utilizing the great power now lying dormant in the waste gases of mines.

Speaking of the experiments and tests that are being made in the Loomis colliery, it can be stated with certainty that the mine management are running no risks of blowing up the plant or causing an explosion within the mine. Whether these tests will prove successful or not, the results obtained will surely add to our knowledge regarding the handling and the possibility of utilizing this most important of the mine gases.

CALCULATING THE HORSEPOWER OF THE WASTE GAS

In order to comprehend the immense possibilities of the problem before the management, let us consider the amount of gas that passes through a large fan, say one that is handling 200,000 cu.ft. of air per min. Assuming that this air coming from the Loomis colliery contains, as stated in Mr. Owen's letter, 1 per cent. of methane and the specific gravity of the gas being 0.559, the weight of gas passing through the fan in 24 hours would be $24 \times 60(0.01 \times 200,000)(0.559 \times 0.076) \div 2000 = 61.177$ tons.

Now, as estimated by Mr. Owens, the complete combustion of 1 lb. of methane generates 23,513 B.t.u. But the calculation shows the escape of $(61.177 \times 2000) \div 24 =$ say 5100 lb. of methane per hour. Then, if this weight of methane is burned to carbon dioxide and water, each pound of the gas yielding 23,513 B.t.u., (since 2545 B.t.u. per hour is equivalent to 1 hp.), this weight of gas escaping from the mine per hour is equivalent to $(5100 \times 23,513) \div 2545 = 47,000$ hp. The figures showing this tremendous potentiality in the return air of a gassy mine are staggering, to say the least.

Referring again to the tests made at the Loomis colliery and the attendant dangers mentioned by Mr. Owens, it can be said that arrangements are being made to increase or decrease the amount of pure air, which is added to the mixture drawn from the mine, so as to maintain a more uniform degree of inflammability and keep the mixture well below the explosive

limit of the gas. It may even be found possible to make this control automatic, so that should there suddenly occur an increased percentage of gas in the mine air, this would be at once compensated by a corresponding increase in the addition of pure air, before the mixture enters the furnace.

The suggestion has also been made that the pipe line may be further protected by a gauze that will isolate the firebox of the furnace from the mine, after the principle of the safety lamp. It is further stated that a careful watch will be kept on barometric changes, knowing that a falling barometer is commonly followed by an increased outflow of gas in the mine. When these precautions are taken, it does not appear to me that any trouble need be anticipated, and the ultimate success of the plan will certainly reflect much credit on the men responsible for its development.

West Pittston, Penn.

RICHARD BOWEN.

Drawing Pillars in Machine Mining

Letter No. 10—Referring to the letter of D. F. M., *Coal Age*, Feb. 6, p. 288, permit me to say that I agree with him in respect to the method that he has explained of drawing back the pillars with machines. There is one point, however, that I think is misstated in his letter. I have reference to the fact that the pillars should be attacked from the side opposite to the fall and not as explained in that letter, "by cutting through the rib in No. 1 room with the machines."

If the pillar is cut through from No. 1 room, there will be left what I call a "pick stump." When this stump is removed, there remains too little support for No. 2 pillar, which is apt to be crushed by the weight thrown on the end of that pillar, which is about 50 ft. back of the first pillar, the road in No. 2 room being all open.

Instead, however, the first pillar should be started and cut through from No. 2 room or on the side opposite to the fall, which will give better protection while the cut is being made and avoid the road's being closed before the remaining stump is all removed. In the same manner, No. 2 pillar should be cut through from No. 3 room, and the same order followed in all the rooms.

It is best to keep the line of pillar work on an angle of about 45 deg., which tends to cause the roof to break more against the rib of the pillar, and less weight is thrown on the pick stump, which is then removed with less difficulty than where the pressure is thrown with greater force on the supporting stump, as must be the case in the figure on page 288.

Crafton, Penn.

RICHARD McDOUGALL.

Letter No. 11—We are drawing pillars, with Sullivan machines, under almost identical conditions with those mentioned by "Operator," *Coal Age*, Jan. 2, p. 32. The

²This correction was made by D. F. M. in a second letter that more fully explained his sketch and which was published in *Coal Age*, Feb. 27, p. 415.

coal seam varies from 4½ to 5 ft., in thickness, and is overlaid with from 30 to 40 ft. of solid sandstone, at a depth reaching from 50 to 800 ft. below the surface. The lower half of the seam is a hard splint coal, while the upper half is softer and contains a 6-in. band of laminated or bone coal.

In our mine, the rooms are driven on 60-ft. centers and are 28 ft. wide and 350 ft. long. Rooms are opened on one side, only, of each pair of headings, and a solid pillar of coal, 70 ft. thick, is left at the head of the rooms, for the protection of the air-course of the next pair of butt headings. Twenty of these rooms form a panel.

When drawing back the pillars, several different methods have been tried, with the object of obtaining the largest possible recovery of coal with the machines. We have found that almost any method will work well, for the first 150 or 200 ft., when starting away from the solid barrier pillar. But, when the first fall occurs and a little weight is thus thrown on the pillars, the proposition grows more difficult, and it becomes necessary to adopt a method that will then give the best results.

The accompanying figure shows the work of drawing back the pillars in progress in a single panel. Four methods of attack are shown at A, B, C and D. At A, the pillar is shown as being cut across on the end, using the machines for that purpose. In this method, however, it was found that when a fall started it would usually come suddenly, and the roof would break tight to the face, the fall frequently catching the track. It can be said, however, that this method works well in a slate top that is carefully timbered.

In the second method shown at B, the pillar is attacked by slabbing the rib, which is undercut the entire length of the pillar with the machine. This method worked well, until the thickness of the pillar was reduced to about 10 ft., after which the work became very dangerous, as the portion remaining was the only solid support for a considerable area of roof. While the weight resting on this stump was not sufficient to make it easily mined with the pick, any attempt to use the machine resulted in the coal settling down in a manner that made very hard cutting. Moreover, there was the added danger that the whole exposed area of roof would fall with the coal. It has been our luck to have two machines caught, in the attempt to use this method. They were both badly smashed.

The plan of starting the attack on the inby corner of the pillar and cutting out the coal on the bias, as shown at C, gave a little better success, but presented the disadvantage that when a big fall occurred, it was very apt to follow a featheredge and extend up into the rooms, thus cutting off the working face and making it very difficult to recover the balance of the pillar. Usually, a portion of this coal would have to be left, which was sure to give trouble later.

In all of these methods, timbers must be set regularly for protection against loose roof, but excessive timber-

ing is of no avail. While large posts or many posts are useful at times, for special purposes, they generally serve to delay a fall, for a short time only; and when this finally occurs, the fall is greater and extends farther up into the rooms.

Our experience is that the best method to employ, and the one that recovers the most coal with the greatest regularity and safety, is the method shown at D. As this method has been fully described in previous letters, in *Coal Age*, it is only necessary to say, here, that a crosscut is first driven through the pillar with the machine, leaving about 6 ft. of solid coal on the gob side, for the protection of the work. The center of this stump is then cut out by the machine, leaving the two small stumps, as shown, one at each corner, to be removed by the pick.

This method has the advantage that the cut is always in the solid, with no large open areas behind the machine. It is economical of timber, the roof being supported by the coal stump, until the machine has finished its work and is withdrawn. In the use of the first method explained, roof falls occurred in increments of from 60 to 100 ft., while in the last method mentioned, these increments were reduced to from 18 to 30 ft., with a less thickness and a better control of the fall when the roof started to break.

Stone, Ky.

MINING ENGINEER.

Waste of Coal

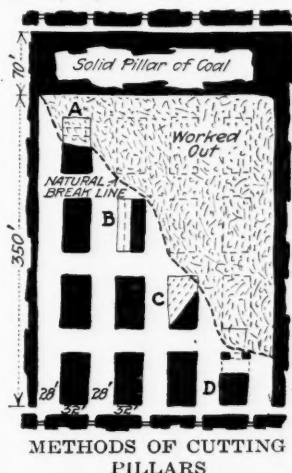
Letter No. 4—When Joseph R. Thomas remarked, in his excellent letter, *Coal Age*, Jan. 16, p. 160, that "we will never miss the coal till the fire goes out and the bin is empty," he could not have stated the truth more emphatically. He has done well to suggest a discussion of this subject from a practical standpoint.

Most men will agree that war-time requirements have made two things clearly discernible by the public eye. Either mining methods have very greatly improved, or the higher price paid for coal has caused operators throughout the country to mine and send to market coal that could not be mined at a profit, under the low prices prevailing previous to the war. Surely, there never was a time in the history of this country when the coal mines have been worked to their capacity, as during the past year or two.

LARGE RECOVERY OF COAL UNDER WAR STRESS

While there is no question but that much coal has been and is still being wasted by improper methods of mining and the careless disregard of necessary precautions on the part of both miners and mine officials alike, yet it cannot be denied that the war crisis made it possible to recover much coal that was previously considered as unmineable at a profit. I will cite a single instance that came to my notice some time since.

In a certain bituminous mine, the coal pitched so heavily in one section of the workings that cars could not be taken to the face. Still, the pitch was not great enough to cause the coal to slide down the chutes. For this reason, work was abandoned in that section and the miners transferred to a portion of the mine where the conditions were more favorable. It was not long, however, before all the available coal in that section was worked out and the foreman was obliged to again consider the working of the coal that he had previously abandoned.



Such was now the demand for coal that the foreman ordered sheet iron to lay in the floor of the chutes, which enabled the coal to slide freely to the heading below. Previous to this he had argued that the price paid for coal would not admit of this extra expense. Even then it was a common remark among the miners that the company would never get enough coal from that section to pay for the sheet iron; but the results soon proved to the contrary.

While one cannot say that the use of this sheet iron was an improved method of mining the coal, it resulted in saving what would otherwise have been an enormous waste of good coal. Lining the chutes with sheet iron, in such cases, has been in use for years, in the anthracite region, and this foreman simply used the same means when the situation required or the opportunity presented itself in the bituminous field.

RAPID GROWTH OF SMALL OPERATIONS

Another feature, which has been brought to the notice of *Coal Age* readers, and has led to the development of large quantities of coal that was previously considered unmineable, is the number of small mines that were opened everywhere because of the extraordinary demand for coal during the war period. Many of these mines were isolated from railroads or other shipping facilities and had to be worked as "wagon mines."

In other cases, much coal was recovered from the outcroppings of larger mines, that had previously been abandoned. There is little doubt but that these small operations supplied much local trade and made it possible to devote the entire output of railroad mines to supply the needs of the war. Since much of this coal would never have been mined, it is clear that the war crisis has had a good effect in making plain the fact that much coal formerly regarded as unmineable and abandoned can and should be utilized.

There is no question but that, as indicated in Mr. Thomas' letter, much coal is wasted by careless miners not cleaning their places and allowing good coal to become lost in the gob, as well as in other ways, such as falling off the cars when being hauled to the slope bottom, because the car was improperly loaded or, perhaps, badly in need of repairs. A good foreman will see that the causes for such waste are removed as far as possible and careless miners trained to better habits.

Roads over which coal is daily hauled should be cleaned at regular intervals and kept in good condition to reduce this waste to a minimum. It must be remembered that every ton of coal lost or wasted shortens the life of the mine and reduces its value. Conservation of coal has been preached for the past ten years and yet many fail to consider its importance. It is hoped that these will be impressed with such a discussion.

Jacob, Penn.

H. G. COCKILL.

Reducing Ventilation at Firing Time

Letter No. 5—I recall distinctly that this subject was discussed in *Coal Age* several years ago. As I did not voice my sentiments at that time, the reopening of the discussion affords me an opportunity to express a few thoughts that are, perhaps, worthy of some consideration.

It is my belief that any attempt to reduce the ventilation in a mine, at the time of shooting, should be considered as an acknowledgement that a dangerous condition exists that requires some modification of the ventilating system, in order to avert trouble. If this is the case, it is a virtual admission of inefficiency, in respect to the ventilating system in use. All obtainable statistics relating to accidents in mines have shown conclusively that the majority of these accidents are either the direct or indirect result of carelessness or inefficiency, for which there is no excuse.

It is useless to argue this question, having in mind the presence of explosive gas only, since gas does not constitute the real danger in respect to explosions. The examination of mines where explosions have occurred invariably reveals the presence of coke that has been deposited on the ribs and timbers, which is evidence that dust and not gas is the real danger that must be avoided.

For over a century dust has been the main factor that has played havoc in the mines and proved itself the dangerous enemy of the coal-mining industry. In the year 1803, a Mr. Buddle, one of the pioneers in British coal mining, stated in his report of an explosion that had occurred in a dry and dusty but nongaseous mine that the men were burned by incandescent coal dust carried by the air current.

Now, the old saying is that "the value of a tooth is reduced where there is nothing for it to do." Working on this principle, the most effective method of dealing with the dust in coal mining is to treat it in a manner that will render it inactive and thus destroy its value in respect to producing an explosion.

The methods of treatment of coal dust have been fully explained in past issues of *Coal Age*, and I think it has been fully proved that the best method of keeping a dusty mine safe, at shooting time, is to employ a systematic system of sprinkling and washing down the ribs and timbers where the dust has accumulated. In addition to this, all accumulations of dust on roadways and travelingways should be removed regularly from the mine.

EXPERIENCE.

Birmingham, Ala.

Efficiency in Mine Management

Letter No. 4—In a recent letter that appeared in *Coal Age*, Jan. 30, p. 246, the writer referred to the position of mine superintendent as not being "an office job." The reference brought to my mind a conception that I formerly had of that official. I regarded him as a man who was able to produce the desired tonnage at a satisfactorily low cost. I thought of him as spending the greater part of his time in the office and only making an occasional inspection of the mine, which he generally left to the charge of the mine foreman.

A few years of close observance have shown me that there are many attributes needful to make a successful mine superintendent. He must, of course, be able to produce coal at a low cost and keep the mine in good condition and safe for work; besides, he must possess a sense of fairness that will enable him to see the other fellow's side of a question; he must also manifest an ever-ready sympathy, tact and diplomacy, together with not too keen a sense of humor in all his dealings.

To define what is a superintendent is about as difficult as to answer the question, "How old is Ann?" A

picture arises in my mind of the superintendent of a certain large operation. This man had been in charge for several years and had made himself familiar with the employees and their families. So successful had he been that there was little change among the mine employees; few were hired or discharged. Many of the men had been in the employ of the company for years and had built their homes, which was true alike of both the foreign and American miners working for that company. It may be amusing but, to my mind, it should prove instructive to cite, in order, the events of a single day in that superintendent's life. The narration would read as follows:

ONE DAY'S RECORD IN THE AFFAIRS OF A SUCCESSFUL SUPERINTENDENT

Going to the office at 7:30, he started to open and read the mail, only to be interrupted by the electrician who came in from the power house with a list of needed supplies and repair parts and departed, after a few minutes' talk on some phase of his work. The superintendent resumes his task of reading over the mail and dictates a letter, in the midst of which he answers the telephone and again takes up the dictation only to be interrupted by Dick H., who comes in with the request, "Will the superintendent please send a carpenter to fix the back porch of my house, today, as the baby fell down the steps and skinned her nose." The superintendent promises and spends a few minutes to comment on the merits of the aforesaid baby, it being the man's only child.

On the departure of the much-pleased father, the interrupted dictation is once more hardly under way when the foreman calls up on the 'phone and gives an order for supplies that must be sent into the mine at once. That matter being attended to, the next visitor is the stableboss, who brings the information that "the gray mare Lizzie is off her feed." The superintendent goes carefully over the symptoms of the mare and then reads from Gleason's Horse Book, after which he concludes that the illness is not serious enough to call a veterinarian. He gives the stableboss some remedies and instructions and turns again to his dictation.

A few moments later, Mike Russ slips in to know if he can have enough bricks to build him an oven. The oven question being settled, Mrs. T appears and asks if it would be all right for her to move into the house that Mrs. K has just vacated. Inquiry by the superintendent brings out the fact that Mrs. T's reason for making the change is that Nick Slovak's chickens scratch up her flower beds, which the superintendent promises to remedy by building a more substantial fence between the properties.

The superintendent, here, puts in a long-distance call and has hardly done so when Mrs. T bursts into the office with a tale of woe of how Mrs. K had called her names; and "won't the superintendent please move Mrs. K into some other part of the town." Immediately after, Mrs. K appears on the scene with a similar tale of woe and some few minutes and the utmost diplomacy on the part of the superintendent are required to subdue that irate woman and restore her surface calm. This episode is happily cut short by the ring of the telephone. A few minutes' talk over the 'phone is followed by the carpenter, who comes in with an order for four panes of glass for house No. 77, stating that Jones' kids broke two windows playing "Andy Over."

The noon hour has now nearly arrived and, after a little routine work, the superintendent goes to lunch. Lunch over, he makes a brief visit to the power house, tiddle or store, often taking a run into the mine, which may occupy the rest of the day. Not going into the mine, he starts for the office within an hour, but is intercepted on his way by Mrs. I, who wants a donation for the minister's new furnace. This woman is a born talker and relates at some length her experiences in the hospital, when she broke her arm last fall. The superintendent fidgets from

one foot to the other and at last is glad to escape with a much-flattened pocketbook.

Finding a salesman in waiting at the office, the superintendent gives him an order for supplies, chats a few minutes and then turns to some work, going over the reports from the mine. In this, he is interrupted by Bob L., who wants to know why he is charged \$6 for rent instead of the \$4 that he is accustomed to pay. Another caller claims that he is short two cars and the superintendent turns him over to the bookkeeper, asking the latter to explain. Then, John Czek asks the superintendent if he can help him get out his naturalization papers, which the superintendent willingly does. Next, Charlie Y comes out of the mine with a cut on his head and, in the absence of the company doctor, the superintendent dresses the wound, putting in one or two stitches. This done, he barely has time to sign a few letters when his wife calls to know if he is ever coming home to dinner.

Responding to the dinner call, this affable superintendent had just left his desk when Mrs. R comes in to ask if he will please address a letter for her to her boy in France, as she does not write very well. Unlocking his desk, he addresses the letter and goes home to dinner. The meal is but half-eaten, however, when a loud knock at the door announces Dick T who wants the superintendent to come at once to his house, stating that two of his boarders got into a fight, with the result that one knocked the other down and he thought the man was dead. Leaving his dinner, the superintendent responds to this call, also, and finds much to his relief that the man was only stunned. He quickly settles the trouble between the fighters and goes home.

Reaching his house and the meal being scarcely finished, Tom W appears at the door with his wife, bearing a peculiar-looking package under his arm, which proves to be a hen, a half-dozen fresh eggs, and a pumpkin pie, all of which the good woman presents to the superintendent's wife with an appropriate speech and receives her thanks. Tom W then broaches the subject to the superintendent of his proposed new house and asks his help in arranging the plans and contracts. This the superintendent gladly agrees to do, and the three depart for the office, the superintendent returning home about 9:30 or 10 o'clock.

Such is the full day of one active and successful mine superintendent.

SPECTATOR.

—, W. Va.

Efficiency in Firebossing

Letter No. 8—From the reading of Letter No. 3 on this subject, *Coal Age*, Jan. 23, p. 199, I am inclined to think that its writer, Edward H. Coxe, must be a superintendent. Speaking from my own present position as mine foreman and with a full knowledge of the duties of a competent fireboss, permit me to say that when a fireboss does his duty, the mine foreman will not need to set him to work digging a ditch or timbering a roadway.

Allow me to suggest to Mr. Coxe that he acquaint himself a little more with the requirements of the state mining law (Penn.) and then read up a little on accidents and how to prevent them in coal mining. If this is done with the sincere purpose of making a coal mine safe for work, the result cannot be otherwise than to change his opinion in respect to the daily employment of firebosses.

In many cases, the fireboss, having made his first examination of the mine, can assist in giving out the lamps to the men and, if he is on his job, he will explain, in detail, to each man who works in his section, what conditions he found in his place. He will willingly give the mine foreman an idea of what coal is loaded and ready to haul, and make other suggestions regarding work that must be done on the roads and in the working places.

A little later, the competent fireboss will be found making the second round in his section. This time, he gives more attention to the examination of the roof and observes carefully the manner in which the miners perform their work. The balance of his shift is spent talking with each man and advising him in regard to keeping his place safe.

Where pillars are being drawn, the fireboss must climb well up on the falls to ascertain the condition. Naturally, he performs many minor tasks such as giving information to drivers, assisting in lifting a car onto the track where it has been derailed, or helping a miner to set a post under a loose piece of top.

Such is a brief outline of a good fireboss' daily work. But, too often it happens that a fireboss is only interested in the theory of his work, as far as it will assist him in getting his certificate. When that is secured the books are sold or thrown aside and given no further attention or study. Such men seldom prove efficient or competent.

Incompetency, however, is not confined to firebossing, and I cannot refrain from saying a word here in regard to its effect in the mine when a superintendent is incompetent. Either there is a lack of proper supervision of the work, on his part, or the orders given by him prove impracticable and cause much trouble and friction in the mine.

At times, it has happened that good mine foremen have been obliged to resign their position, on account of the incompetency of their superiors in office. When that is the case, time is required to break in a new man and much loss results to the company. In my opinion, every mine superintendent should have at least eight or ten years' practical mining experience before assuming the duties of that office. He should hold a first-class, mine foreman's certificate.

Oliphant Furnace, Penn.

JOHN H. WILEY.

Letter No. 9—Holding certificates, as I do, for both mineboss and fireboss, in this state, has made me much interested in the discussion, in *Coal Age*, regarding the latter position, which certainly has its good and bad points. Some time ago, I contemplated taking a position of fireboss that was offered me, in a certain mine, but asked that the place be held open for a few days, in order to give me time to consider it.

The advantages of firebossing may be briefly stated as follows: The position offers regular work and is not as laborious as most of the work performed in coal mining. The work is much more interesting than that of loading coal and offers greater opportunity for promotion.

THE DIFFICULTIES OF FIREBOSSING

On the other hand, there are disadvantages connected with firebossing, and these should always be considered, before a man takes upon himself the duties of that position. In the first place, the work of firebossing requires a man to leave his home in the early morning hours and start his examination of the mine alone. He must face many dangers, which no one understands better than the one who has encountered them. The fireboss is responsible for the safety of every portion of the section in his charge. His work must be completed and he must be back at the entrance of the mine in time to make his report before the men proceed to work.

Aside from these difficulties and dangers that surround the fireboss, in the performance of his work, there

is too often a disposition on the part of a foreman to treat the fireboss in a way that is not pleasant. Frequently, his work is underrated as being of less importance than that of the foreman who has full charge of the mine. In the State of Indiana, I may say that more technical knowledge is required of a candidate for the position of fireboss than is necessary to secure a certificate to act as mineboss or foreman, and this fact may cause some foremen to berate the work of the fireboss.

To such an extent did this condition exist here, some years ago, that there was much talk of the firebosses organizing for their own protection. They hoped, by pooling their strength, to overcome the growing injustice that they felt was being done them, and secure better recognition and increase their chances for promotion.

ESSENTIALS TO SECURING HIGHEST EFFICIENCY

The question of attaining the highest efficiency in firebossing is well worthy of discussion and I want to make the following suggestions:

1. The ventilation of the mine should be entirely in the charge of the fireboss as it affects, primarily, his work of examining the mine, and is the chief element in securing safe and healthful conditions.

2. The fireboss should be given no more territory to examine and supervise than will permit him to do that work in a thorough manner. He should be given men to build all necessary doors, stoppings and overcasts and to assist in erecting brattices where these are required.

3. While I see nothing wrong in a fireboss turning his hand to do any work that may be required of him, it must be admitted that where a fireboss is put to loading coal, laying track and performing other work, to the detriment of his own, the effect will be to lower his prestige and impair his authority. There must be strict discipline to insure safety in coal mining.

4. The examination of a mine should never be started five or six hours before the time for work to begin in the mine. Particularly in a gassy mine, the mining law should restrict the time for beginning the morning examination to two or, at the most, three hours before the men go to work.

5. The fireboss should live as near as practicable to the mine, in order to avoid loss of time in going to and from his work, and that he will be able to reach the mine quickly in case his presence is needed in any emergency that may arise. In many cases, living close to the mine would mean to occupy one of the company houses, which are too often set close together with little opportunity for gardens and outhouses, such as barns, cow-sheds, and yardroom for hens and chickens, which many firebosses desire in their home surroundings. It is these comforts of life that add to the efficiency of all mine employees, particularly of firebosses, whose early morning work shortens the hours of his shift, in the day, and gives him opportunity for some outdoor work and exercise.

In closing, I want to mention that there is a custom prevailing in some of the mines in this state, where the duties of the fireboss are light, to make the roomboss perform the duties of a fireboss in connection with his own work. The roomboss, in Indiana, is really an assistant mineboss (foreman). He must hold a mineboss certificate, and is also required to have a fireboss certificate if his work combines the two positions.

Linton, Ind.

W. H. LUXTON.

INQUIRIES OF GENERAL INTEREST

EDITED BY JAMES T. BEARD

Roof Conditions in Longwall Work

I have a longwall proposition that I would like to submit to the readers of *Coal Age* and get their ideas in regard to the best method to adopt in order to secure the best results. The proposition is as follows:

Ours is a bituminous coal of average hardness and 3 ft. 4 in. thick. Immediately above the coal is a 9-in. layer of very hard sandrock, which is overlaid with about 3 ft. of a soapstone formation. Above the soapstone, again, is sandrock. The coal is underlaid with 3 ft. of fireclay, which heaves slightly under the roof pressure.

The question I want to ask, particularly, is, Should this top be broken at regular intervals, using cogs for that purpose; or should the packs be so arranged that the roof will settle gradually on the waste, without breaking?

SANDROCK.

Landstreet, Penn.

Coal Age will be glad to receive the suggestions of its practical readers who have worked longwall under conditions similar to those mentioned in this inquiry. It is to be regretted that the correspondent has not given the depth of cover. However, this can be assumed as varying from 200 to 300 ft.

The experience of the editor, in dealing with longwall work, is that, as a general proposition, it is far better to build solid packwalls and arrange these in a manner that will induce a regular and uniform settlement of the roof. The underlying principle of longwall work is to maintain a traveling weight or overburden bearing on the face of the coal and only sufficient to break down the coal when the latter has been properly mined.

In the best longwall practice, the roof should not be broken if it can be avoided as that would at once relieve the pressure, which must be utilized to break the coal. Moreover, the roof is liable to break off at the coal face, unless it is properly supported and controlled by uniform packs. The breaking of the roof at the face is the one thing that must always be avoided, in longwall work, as it destroys the principle on which this system of mining depends.

Tonnage per Foot-Acre

Please explain the rule for estimating the number of bushels of bituminous coal underlying an acre of land when the seam has a uniform thickness of 5 ft. This coal will average 80 lb. to the bushel, or $2000 \div 80 = 25$ bu. per ton. There is, I understand, a rule for estimating the tonnage, which is generally used in practice.

BITUMINOUS.

Martins Ferry, Ohio.

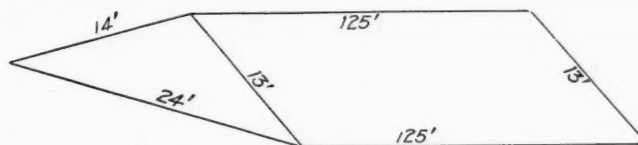
The rule to which this correspondent refers is one that is based on an assumed extraction of two-thirds of the coal underlying an acre, which was quite common practice, in bituminous mining more than a decade ago. The average specific gravity of bituminous coal can

be taken as 1.27, which makes its weight $1.27 \times 62.5 =$ say 80 lb. per cu.ft. There are 43,560 sq.ft. in an acre; and the weight of coal per acre, for a thickness of 1 ft., is, therefore $(80 \times 43,560) \div 2000 = 1742$ short tons. Then, assuming a two-thirds extraction, the weight of coal available per foot-acre is $\frac{2}{3}(1742) = 1161$ short tons.

On this basis, the common practice was to estimate 1200 short tons, per foot-acre, of bituminous coal. Since the extraction of coal, at the present day, far exceeds two-thirds of the entire amount, a closer estimate for bituminous coal would be to allow 1500 short tons, per foot-acre, as the available coal in a seam.

Measuring a Coal Pile

Kindly permit me to ask how a coal pile having the shape and dimensions given in my sketch can be measured to ascertain its contents. The ground is flat. The coal was unloaded, by hand, along a railroad track.



SHOWING SHAPE AND DIMENSIONS OF COAL PILE

From the ridge line, the coal sloped each way uniformly, the length of slope being 13 ft. on one side and 14 ft. on the other side, while the spread at the base measures 24 ft. across. Kindly explain the manner in which the contents of this pile is calculated. The coal is mine-run bituminous coal.

COAL DEALER.

Chicago, Ill.

In this inquiry, no data are given to determine the slope at the two ends of the pile; but, judging from the sketch, the coal may be regarded as stacked between two walls, making the two ends vertical and parallel. On this assumption, it is only necessary to calculate the area of a triangle whose three sides are 13, 14 and 24 ft. in length; and multiply this area by the length of the pile, which is 125 ft., as indicated in the figure.

The area of a triangle the three sides of which are known is calculated by the formula,

$$a = \sqrt{s(s-a)(s-b)(s-c)}$$

To apply this formula, let a = the sectional area of one end of the pile and s = the half-sum of the three sides, a , b , c . The half sum of these three sides is $\frac{1}{2}(13 + 14 + 24) = 25.5$ ft. and, substituting this and the given values in the formula, we have,

$$a = \sqrt{25.5(25.5 - 13)(25.5 - 14)(25.5 - 24)} \\ = 74.15 \text{ sq.ft.}$$

The cubical contents of this pile is, therefore, $74.15 \times 125 =$ say 9269 cu.ft. Mine-run bituminous coal measures 40 cu.ft. to the short ton. The weight of coal in this pile is, therefore, $9269 \div 40 = 231\frac{1}{4}$ short tons. Estimated in bushels, the pile contains, approximately, $231\frac{1}{4} \times 25 = 5793$ bushels.

EXAMINATION QUESTIONS

EDITED BY JAMES T. BEARD

Alabama Second-Class Examination Birmingham, Jan. 20-23, 1919

(Selected Questions)

Ques.—What dangers arise from blasting coal out of the solid?

Ans.—Coal that is blasted out of the solid is not mined or side cut, and there is little opportunity given for the charge of powder to do its work properly in breaking down the coal. Under certain favorable conditions in the coal seam, it is possible to employ what is sometimes called a "grip shot," in which the drill-hole is inclined at a sharp angle with the face of the coal. While this shot may not be mined or side cut, the butt cleats often existing in the coal cause it to break easily and there is no particular danger.

On the other hand, when these conditions do not exist and the shot is not mined or side cut, or when the charge is located on the solid beyond the cutting, there is danger of a blownout or windy shot being produced. In either case, much of the force of the explosion is spent on the air, instead of being absorbed in the breaking down of the coal. A large amount of heat and flame is produced, and there is danger of gas or dust being ignited and causing a local explosion, which may or may not be transmitted throughout the mine, depending on the condition of the mine air and the workings.

Ques.—How would you timber an airway when the bottom is soft or wet?

Ans.—Where the bottom is soft or wet, there is danger of the posts supporting the roof being forced down through the clay, leaving the roof free to settle heavily on the pillars, which are crushed by the undue pressure thus thrown on them. To avoid this contingency, the posts should be set on footboards whenever the bottom is soft or wet, so as to distribute the pressure and give a firmer footing to the posts. Under these conditions, extra precaution is required, in order to reduce to a minimum the danger of squeeze or creep, particularly if a good width of pillar has not been provided to avoid this trouble. In airways where the roof conditions are such as to require the timber frames to be set but a few feet apart, side sills are generally used instead of footboards. The bottom should then be well drained by ditches on both sides of the track.

Ques.—What dangers and difficulties are encountered from a mine squeeze?

Ans.—The occurrence of a squeeze in mine workings throws an undue pressure on the pillars left to support the roof and protect the roads and airways. The mining of the pillar coal is then more difficult and dangerous, because of the great weight on the pillars, which crushes the coal, and because of the danger of heavy roof falls when the pillars are withdrawn. Owing to the crushing of the pillars, it frequently happens that much good coal is lost beyond recovery. When roads are cut off or completely closed by the advance of the squeeze much tracking and timber also are lost.

Ques.—When extracting pillars, how should the general line of face be kept?

Ans.—The ends of the pillars should be kept in line with each other so as to provide a continuous break line, and produce a more uniform and gradual settlement of the roof in the gob. Where the line of fracture is straight a more uniform pressure is thrown on all the pillars alike, but when one or more pillars fall behind the others, the coal in them is crushed by the undue weight they carry. The line of fracture will generally need to be kept at an angle approaching 45 deg. with the entry to obtain the best results; but this is not always the case, as much will depend on the conditions in the seam and the overlying strata. These conditions must be carefully studied to determine the best line of fracture in drawing back the pillars.

Ques.—What should be considered in determining the size of pillars, in mines?

Ans.—The chief factors in determining the size of pillars, in coal mining, are the depth of cover, width of opening, thickness and character of the coal, nature of the overlying and underlying strata, and the time that the pillars must remain before being withdrawn. The presence of slips or fault lines in the formations must also be considered with regard to the effect produced on the working of the seam. The presence of water in the strata will soften the floor and roof of the seam, and require greater pillar support than is necessary in dry workings. The presence of gas in the floor or the roof of a coal seam may give unexpected trouble by causing the bottom to heave or the roof to fall.

Ques.—Why is the single-entry system of operating almost certain to prove a failure?

Ans.—In a single-entry system of working, the air current must be returned along the faces of the rooms, since there is no separate return airway provided. In this system, a fall of roof at the face of one or more rooms may block the entire circulation in the mine, until another opening can be made to conduct the air current to the return opening. When this happens the system of ventilation is a failure.

Ques.—What is the best mode of ventilation to adopt?

Ans.—The plan of ventilation of a mine should be such as to meet the particular requirements. There should always be a separate intake and return airway provided, except in longwall work, where the air travels the working face throughout the most of its course. In a small mine, the double-entry system will generally prove sufficient to meet every requirement; but, in a gassy mine, three or more main entries may be needed, in order to provide ample area in the return airway. In many mines producing large tonnages it is necessary to provide a multiple system of main entries, in order to secure the best results with regard to economy and safety. As the workings are extended, the mines should be divided into separate sections and each section ventilated by a separate air current. This is accomplished by splitting the main air current and building an air bridge at that point to carry the air across.

BOOK REVIEWS

To Avoid Blind Guesses at Probable Cost

MECHANICAL AND ELECTRICAL COST DATA. By Halbert P. Gillette and Richard T. Dana. Pp. xvii + 1716 + 16 index; 4 1/2 x 7 in.; adequately, but not profusely, illustrated. McGraw-Hill Book Co., Inc., 239 West 39th St., New York City, publisher. Leather cover. Price, \$6 net.

The weakest element in the engineer's whole equipment is in costs. The bulk of the training of the engineer tends to lead him away from the subject. Most of the craft have been drawn to the engineering profession by a delight in pure science, and scientists at heart they always remain. But they absorb a few "base mechanical" facts, to quote Shakespeare, in the course of their college or university training, though such facts are grudgingly given by instructors and unwillingly accepted by the student. The cost element of training comes last. It is the hardest information for the instructor to secure; it is contrary to his psychology and, as it is also alien to the psychology of the students, it is quite generally neglected.

MANAGER KNOWS, YET ASKS ENGINEER TO ESTIMATE

Besides, both preceptor and pupil argue, the study will serve only for a while, for prices are fleeting things, lasting only till the union forces a new wage scale, conditions of business introduce a new labor psychology, or the manufacturer prints a new discount table. But after all, despite the haughtiness and aloofness of such a superior being as the mining engineer believes himself to be, he must pay attention to the present and the ephemeral if he is to be successful. He is in an unfortunate position and one it is hard for him to correct. Under the present absurd division of labor, the manager does the buying, the book-keeper keeps the accounts and the poor devil of an engineer estimates probable cost of construction. No wonder his estimates are too frequently a joke.

But how will a cost book based on pre-war figures help a man to learn as much or more than the manager who knows the real costs and propositions of manufacturers and who keeps all that knowledge in his managerial bosom. Gillette and Dana in an introduction declare that such a book on "Mechanical and Electrical Cost Data" can and will help considerably, for any labor costs can be multiplied by the factor representing increase in wages and so corrected. They also declare that any machine costs can be determined when the increased cost factor has been determined for any one class of machine, for as one machine increases in cost another is almost sure to increase. So long as the design is not changed materially a fairly safe estimate can be made. The engineer must be patient. He cannot secure the impossible, and his judgment is shown in securing the best help that is offered.

INTEREST CHARGES DURING CONSTRUCTION

The writers of the book certainly open up ideas on valuation in their department entitled "General Economic Principles." The reviewer has looked long and unsuccessfully for a statement like the following:

"Very few operating companies charge any interest during construction, when new construction proceeds *pari passu* with renewals. In other words, after the original nucleus of the plant is built, the 'interest during construction' account, if ever there was one, is closed."

"If ever there was one," is a good reservation. The reviewer recalls one well-posted accountant who refused to allow for interest during construction unless that interest was actually paid to someone. If money was borrowed to build a plant, that plant was, by his way of reasoning, worth more than if the money was subscribed. When urged that work by a construction company was loaded with interest, profit and risk charges during construction

he replied that he knew it, but to add interest during construction where a company constructed a plant with its own money was to credit a profit on the investment when no profit was actually made.

The section, just quoted on "General Economic Principles" contains many other wise considerations. Then follows "Depreciation, Repairs and Renewals," with a long table showing the estimated life of plant units in years, with the authorities for such estimates. This table is insufficiently detailed; for instance, ties for track construction are credited with a life of 8 years, of 13.3 years and 20 years. No attempt is made to differentiate the kind of ties of which the longevity is given. Steel, locust and hemlock ties are not given their appropriate longevities, nor is there any reference to the place and conditions of use.

Running rapidly over the book, Cost of Buildings, Chimneys, Moving and Installing, Fuel and Coal Handling, Steam Power, Internal Combustion Engines, Hydro-Electric Plants, Electric Light and Power Plants, Overhead and Underground Electric Transmission, Lighting and Wiring, Belts, Shafts and Motor Drives, Compressed Air, Gas Plants, Pumps and Pumping, Conveyors, Hoists, Cranes and Elevators, Heating, Cooking and Ventilating, Electric Railways and miscellaneous matters, such as arc welding, are taken up in turn. This is a handy book, a good companion to "Handbook of Cost Data" by Gillette and "Handbook of Construction Plant and Its Cost" by Dana. Every mining engineer's office of any pretension should contain all three. They do not cover the same ground, but supplement each other.

How To Store Goods With Profit

STORING: ITS ECONOMIC ASPECTS AND PROPER METHODS. By H. P. Twyford, Otis Elevator Co. Pages xvi + 196 + 5 index; 6 x 9 1/2 in.; 96 ill. D. Van Nostrand Co., 25 Park Place, New York, publisher. Cloth Boards. Price \$3 net.

Provident storage was ever looked upon as one of the greatest of housewifely virtues—to put things by for future use, to keep them so that they would not spoil, to have them where they could be located even in the dark, to record their number, quality and purpose—these were primal duties and they remain so even today. But nowadays we buy in large quantities, and the problem becomes far larger.

As the purchaser has not expended on the product the labor that a housewife has expended on hers, he is prone to forget just what he has on hand and to order it over again while he still has some of the material in reserve. He has not exerted himself to get it, so he doesn't feel the loss of his labor if the material spoils. Conversely, knowing these failings the manager is opposed to storing because he is afraid the stored material will not be used and because he anticipates that new material will be purchased whenever an emergency arises demanding the use of material of the kind stored.

Therefore methodical storage is the need of the hour, especially for large firms. It prevents excessive buying while permitting of speedy replacements when breakdowns occur. It assists in securing properly balanced buying, and it enables the manager to know just how well he is protected against unforeseen troubles.

Here is a book pointing out the economic questions related to storing, giving details regarding specifications, definitions and standardization, providing suggestions as to the location and equipment of the storeroom, showing what appliances facilitate its operation, detailing the manual, clerical and managerial work involved and then following the material from delivery to exit. Though more adapted to the larger storerooms of manufacturing concerns, it will afford the mine operator and manager many excellent suggestions.

FOREIGN MARKETS AND EXPORT NEWS

EDITED BY ALEX MOSS

Coal Production in Japan

An excerpt from *The Japan Chronicle* of Dec. 24 and 25, 1918, transmitted to the Bureau of Foreign and Domestic Commerce by Consul General George H. Scudmore, Yokohama, states that the output of Japanese coal mines during the last seven years was, in tons, as follows: In 1912, 15,709,663; 1913, 17,050,267; 1914, 17,289,861; 1915, 15,488,828; 1916, 17,476,803; 1917, 19,887,147; and 1918 (estimated), 20,835,254 tons. It will be seen that, compared with the output for 1915, which is the smallest during the last seven years, the 1918 estimate shows an increase of about 35 per cent.

At present about 26 yens (\$12.95) per ton is quoted for Japan best and steam lump coal at Moji, and when freight, landing and other charges are taken into account the price at Kobe will be about 35 yen (\$17.45). Opinions differ as to the outlook of the market. It is true, however, that though there has been a general decrease in the prices of other commodities since the armistice, there has been a continued advance in the price of coal.

At the end of November stocks at Moji and Wakamatsu, taken together (though Moji stocks alone showed an increase), showed a decrease of 55,000 tons compared with the preceding month, amounting to 149,000 tons. Stocks at the pit's mouth at the end of November were put at 296,000 tons, about 26,000 tons less than in October. Present stocks at Osaka amount to about 180,000 tons, a decrease of about 40,000 tons. Though stocks have diminished, there has been no particular change in the demand since the armistice, and it is thought that coal prices will continue at their present level, if not increase. On the other hand, the theory is advanced that the demand is bound to decrease as the result of the industrial slump caused by the termination of hostilities; and, as the number of coal miners will increase, owing to many workers being dismissed by industrial companies, there will be increased supplies in the future, naturally causing a decline in price.

Serious rioting is reported at Gelsenkirchen and other places in the Ruhr coalfield and conflicts between the military and Spartacists. The strikes are now said to have ended, but not before serious damage had been done to coke ovens and other industrial plant.

Hampton Roads Coal Exports

NORFOLK

Lamberts Point		CARGO		BUNKERS	
Mar. 10	Amer. S.S. Ulysses.....	Cristobal, C. Z.....	12,022	1,134	
Mar. 11	Amer. Se. Anna Laura McKenny.....	Rio de Janeiro, Brazil.....	1,558		
Mar. 12	Amer. S.S. Honduras.....	Bridgetown, Barbados.....	2,984	501	
Mar. 13	Amer. S.S. Lake Gradan.....	Bridgetown, Barbados.....	3,595	193	
Mar. 13	Amer. Se. Republic.....	Rio Grande do Sul, Brazil.....	1,119		
Mar. 13	Amer. S.S. Tampico.....	Vera Cruz, Mexico.....	2,318	431	
Mar. 14	Amer. Se. Florence Thurlow.....	Rio de Janeiro, Brazil.....	1,317		
Mar. 14	Amer. Se. Samuel W. Hathaway.....	Rio de Janeiro, Brazil.....	1,404		
Mar. 14	Amer. S.S. Lakewood.....	Rio de Janeiro, Brazil.....	2,020	655	
Mar. 15	Fr. Bark Cape Horn.....	Antofagasta, Chile.....	4,223	48	
Mar. 15	Amer. Se. Mary L. Baxter.....	Rio de Janeiro, Brazil.....	1,445		
Mar. 15	Ital. S.S. San Rossore.....	Gibraltar for orders (Italy).....	6,343	876	
Mar. 15	Ital. S.S. Luigino Accame.....	Gibraltar for orders (Italy).....	3,949	669	
Sewalls Point		CARGO		BUNKERS	
Mar. 5	Amer. S.S. North Bend.....	Huasco, Chile.....	2,751	579	
Mar. 12	Amer. Se. Van Lear Black.....	Pernambuco, Brazil.....	814		
Mar. 12	Amer. S.S. Glen White.....	Rio de Janeiro, Brazil.....	7,038	1,395	
Mar. 13	Amer. Se. Eleanor F. Bartram.....	Pernambuco, Brazil.....	1,606		
Newport News		CARGO		BUNKERS	
Mar. 8	Nor. S.S. Commodore Rollins.....	Santiago, Cuba.....	1,516	402	
Mar. 8	Amer. S.S. Lake Lesa.....	Havana, Cuba.....	3,114	45	
Mar. 8	Amer. S.S. Serpentine.....	Santiago, Cuba.....	808	240	
Mar. 8	Amer. S.S. Serpentine.....	Santiago, Cuba (Coke).....	163		
Mar. 10	Dutch S.S. Hector.....	Amsterdam, Holland.....	3,576	1,050	
Mar. 12	Amer. S.S. Cranenest.....	Pernambuco, Brazil.....	2,042	807	
Mar. 12	Amer. S.S. Lake Marion.....	Antilla, Cuba.....	2,717	328	

American Exports Set New Record

January exports from the United States, valued at \$623,000,000, were announced by the Department of Commerce as exceeding any previous month in the history of American commerce. They compare with \$505,000,000 for January, 1918, and \$566,000,000 for December, 1918.

During the seven months ended with January, exports from the United States totaled \$3,798,000,000, as compared with \$3,450,000,000 for the corresponding period one year ago.

Imports during January were valued at \$213,000,000, the report said, leaving a net trade balance in favor of the United States for the month of \$410,000,000. Imports during January, 1918, were valued at \$234,000,000, and during December, 1918, at \$211,000,000.

Exports continued to show great strength in February, the total reaching \$588,000,000 in value. This is a falling off from

the record January total of \$623,000,000, but as there were only 28 days in February, the daily average would appear to be even higher than in January. The total for the month represents an increase of approximately 42 per cent. over the \$411,000,000 for February of last year. Exports for the eight months ended with February were valued at \$4,386,000,000, as compared with \$3,862,000,000 for the corresponding period of the previous year.

February imports are announced as \$235,000,000, a gain over the \$213,000,000 for January, and over the \$208,000,000 for February, 1918. Imports for the eight months ended with February totaled \$1,933,000,000, as against \$1,841,000,000 for a similar period the previous year.

Foreign Freight Rates

W. W. Battie & Co.'s coal trade freight report for Mar. 17 states that the demand for steamers to take coal to the West Indies was a little better and that a number of charters were effected at the Chartering Committee's rates. The active demand at advancing rates for tonnage for general cargo to transatlantic ports is making it difficult to secure vessels to carry coal to South America, but there are occasional boats inquiring for such business that are willing to accept the Chartering Committee's rates. W. W. Battie & Co. expect to have a number of steamers in the near future that will be available for coals to South America.

The Chartering Committee's rates are as quoted below:

Steam—Havana, \$7.50, 600 tons dis.; Cardenas or Sagua, \$9.300 tons dis.; Cienfuegos, \$9.500 tons dis.; Caibarien, \$9.50, 300 tons dis.; Guantánamo, \$8.50, 500 tons dis.; \$9.400 tons dis.; Manzanillo, \$9.50, 300 tons dis.; Bermuda, \$9.50, and Bermuda, p. c. and dis. free, 300 tons dis.; Kingston, \$9.50, 400 tons dis.; St. Thomas, \$10.500 tons dis.; St. Lucia, \$11.500 tons dis.; Santiago, \$8.50, 500 tons dis.; \$9.400 tons dis.; Barbados, \$11.500 tons dis.; Port of Spain, Trinidad, \$11.500 tons dis.; Curacao, \$10.50, free p. c. Curacao, 500 tons discharge. Rio, \$19.50 net, 1000 tons dis.; Santos, \$19.50 net, 1000 tons dis., or \$21 net, 600 tons dis.; Buenos Aires, \$18.50 net, 1000 tons dis.; Montevideo, \$19.50 net, 750 tons dis.; Pernambuco, \$18.50 net, 500 tons dis. To Nitrate Range, \$16.50 gross prepaid.

Sail (maximum)—Para, \$15.50 net; Bahia, \$18.50 net; Pernambuco, \$18.50 net; Rio, \$19.50 net; Santos, \$19.50 net; Buenos Aires, \$18.50 net; La Plata, \$18.50 net; Montevideo, \$19.50 net. To Nitrate Range, \$16.50 gross prepaid.

The coal crisis in Paris may now be considered at an end.

United States Exports of Coal and Coke by Districts and Bunker Coal by Districts, During January, 1919

Districts	Anthracite		Bituminous		Coke	
	Tons	Dollars	Tons	Dollars	Tons	Dollars
Maine and New Hampshire.....	279	3,576	1,072	7,167	70	616
Vermont.....	1,793	14,210	5,642	32,650	67	675
Massachusetts.....	141	1,767				
St. Lawrence.....	136,005	1,068,744	257,678	999,695	1,515	9,968
Rochester.....	2,876	22,950	53,654	128,484	1,405	9,741
Buffalo.....	212,905	1,521,376	230,746	878,079	16,449	174,368
New York.....	10,367	84,275	3,168	25,108	570	16,091
Philadelphia.....	4,101	31,093	15,390	100,643		
Maryland.....			32,315	200,456	1,878	21,994
Virginia.....			373,222	2,364,698	3,802	49,494
Georgia.....			2,116	17,986		
Florida.....			1,950	13,661		
Mobile.....			1,906	20,889		
New Orleans.....			1,464	10,344	53	1,591
San Antonio.....	114	1,343	2,680	15,697	3,007	28,489
El Paso.....	159	2,419	3,666	25,255	3,122	23,633
Arizona.....			3,452	11,537	16,632	144,214
Southern California.....			15	192		
San Francisco.....					12	180
Oregon.....			800	9,200		
Washington.....			1,404	9,091	90	1,118
Dakota.....			714	4,243	90	692
Duluth and Superior.....			1,360	8,810	26	312
Michigan.....	9	117	123,492	435,030	12,995	121,611
Ohio.....			89,728	337,850	5,740	37,467
Porto Rico.....					3	80
Total.....	368,749	2,751,870	1,207,634	5,656,765	67,526	642,334

BUNKER COAL

	Tons	Dollars
Maryland.....	22,217	129,721
New York.....	211,099	1,266,094
Philadelphia.....	24,697	165,059
Virginia.....	112,932	662,692

Exports of Anthracite and Bituminous Coal and Coke for the Calendar Years 1916, 1917 and 1918

(Compiled by Bureau of Foreign and Domestic Commerce)

Exported to	Twelve Months Ending December					
	1916		1917		1918	
	Tons	Value	Tons	Value	Tons	Value
Italy.....	1,735,072	\$5,143,280	560,628	\$2,082,664	9,994	\$47,710
Canada.....	11,839,447	23,208,952	16,177,571	56,340,315	16,191,364	57,122,873
Panama.....	427,732	1,244,299	618,962	2,240,372	504,126	2,146,085
Mexico.....	196,547	736,171	184,345	921,001	162,631	750,731
Cuba.....	1,284,172	3,762,319	1,410,594	6,293,207	1,440,457	8,476,213
Other West Indies.....	443,200	1,429,265	402,812	1,857,441	254,501	1,503,486
Argentina.....	921,969	3,012,654	317,563	1,637,890	178,899	1,050,717
Brazil.....	782,094	2,938,133	685,142	3,568,001	559,099	3,489,163
Chile.....	152,732	502,706	60,188	342,602	300,062	1,905,885
Uruguay.....	1,194,381	3,850,313	867,515	4,219,161	228,959	1,392,994
Other countries.....					125,917	778,999
Anthracite.....	4,165,652	\$22,470,147	5,363,666	\$30,909,798	4,435,543	\$29,215,689
Bituminous*.....	18,977,346	45,828,092	21,285,320	79,502,654	19,956,009	78,664,856
Coke.....	1,048,790	\$4,202,236	1,258,321	\$8,543,746	1,506,985	\$11,861,408

* Does not include fuel or bunker coal laden on vessels engaged in the foreign trade, which aggregated during the twelve months ending December, as follows: 1916, 7,825,731 tons, valued at \$27,491,822; 1917, 6,883,176 tons, valued at \$31,844,799; 1918, 5,626,175 tons, valued at \$29,868,023.

Large Tonnage Allocated for Coal Export Trade

The increase in the coal exports is reflected clearly in the allocation of shipping made by the Shipping Board Mar. 17. The steamer "Salto" is to carry coal from New York to Montevideo, the "Glen White" from Hampton Roads to Brazil, the "West Indian" from New York to Uruguay, the "North Pines" from Hampton Roads to River Platte points, the "Snug Harbor" from Norfolk to the West Indies, the "Lake Ontario" from Hampton Roads to the west coast of South America, the "Point Lobos" from Hampton Roads to Hawaii.

In addition, the following vessels are assigned to take coal to Brazil: The "Randolph S. Warner," the "E. C. Pope," the "Bulano," the "Mojave," the "Andra," the "Chibiabos," the "Lakeside," the "Lake Shore," the "Biran," the "Lake Huron," the "Lakewood," the "Cranenest," the "Mineola," the "Randwijk," the "Larenberg," the "Sacarappa" and the "Bellatrix."

Other allocations for coal destined to West Indies points are as follows: The "Lake Akkra," the "Lake Forest," the "Lake Champlain," the "Frednes," the "Lake Buckeye," the "Lake Sebago," the "Lake Ledan," the "Lake Deval," the "Lake Butler," the "Lake Duncan," the "Lake Janet."

The following ships have been assigned for the carrying of coal to points on the Rio de la Plata: The "Prococyon," the "Sac City," the "Winterswijk." Other ships assigned to the west coast of South America are as follows: The "Saguache," the "Castle Point," the "Dalana," the "H. Pontepidan." There was also a number of vessels assigned to the carrying of coal to the Pacific Coast, to New England and to various naval coaling stations. The total tonnage assigned for coal is 228,200.

Hampton Roads Coal Exports, February, 1919

	Gross Tons
Norfolk & Western R.R.....	401,951
Virginian R.R.....	210,284
Chesapeake & Ohio R.R.....	184,973
Total.....	797,208

The War Trade Board announces that the export conservation list as of Mar. 1, 1919, includes coal and coke. Individual licenses, however, are not required to Canada and Newfoundland. Shipments of coal and coke to these destinations may be made under Special Export License R A C-63.

Commitments for Export

Instances have recently come to the attention of the War Trade Board wherein certain American exporters have been embarrassed by reason of the fact that they have entered into definite commitments for export shipments prior to the receipt of the necessary export licenses.

The War Trade Board takes this opportunity to renew its warnings to exporters that, although the importer in the country of destination may have contracted to purchase goods and may have cabled that he possesses the necessary import certificate, the prohibitions of the Trading with the Enemy Act and the necessity of maintaining the blockade conditions may prevent the issuance of an export license. In view of the present policy of the associated governments with respect to shipments to the countries contiguous to Germany, the War Trade Board is unable definitely to assure exporters in advance that licenses will be granted. For their own protection, therefore, exporters should obtain export licenses before making definite and unconditional commitments.

Import Duties on Coal and Coke

With American coal exporters seeking new fields for their product, a knowledge of the rates of duties levied on coal and coke shipped to the various countries, are of necessity of much interest to the coal industry. In making use of these rates it should be kept in mind by shippers that authoritative information in regard to the duties can be obtained only from the custom authorities of the country concerned. This precaution is advised by the Bureau of Foreign and Domestic Commerce, at Washington. The bureau also advises that to test the rates small trial shipments are advisable.

It is also explained that when two or more rates of duty are shown for the same article, products of the United States as a rule are admitted at the lowest rate ("conventional" or "minimum"), except: (1) Into France and French colonies, where (in the case of most articles) the "general" rate is applied; (2) into Canada, when the "general" rate is applied; and (3) into other British colonies, where the "preferential" rates (if any) are withheld from all non-British imports.

In some countries there is an addition of surtaxes which are to be added to the rates.

The following tabulation shows the rates of import duties levied by various countries to which American coal is sent:

		Rate of Duty Peso per Kilo	
Austria-Hungary—Coal and coke.....	Free		
Belgium—Coal and coke.....	Free		
France—Coal or coke (general and minimum), francs per 100 kilos	0.12		
Germany—Coal, anthracite, unmanufactured cannel coal, coke and gas coal, from all countries.....	Free		
Italy—Coal and coke (general and conventional).....	Free		
Norway—Coal.....	Free		
Portugal—Coal, per ton.....	0.345 milreis		
Spain—Mineral coal. (Exemption of coal from import and transportation duties in Spain was granted by royal decree of Apr. 7, 1915. No announcement of the reimposition of the duty has been received.)			
Sweden—Coal and coke.....	Free		
United Kingdom—Articles not specified in the tariff.....	Free		
Russia—Coal Imported by the Black Sea or the Sea of Azof, rubles per pound.....	0.066		
Imported by the Baltic Sea, rubles per pound.....	0.0165		
Coal imported by the White Sea is admitted free of duty.			
Canada—Coal, anthracite, anthracite coal dust.....	General Free	Preferential Free	
Bituminous slack coal, such as will pass through a 4-in. screen, subject to regulations prescribed by the Minister of Customs, per ton.....	14c.	10c.	
Plus ad valorem.....	7½ per cent.	5 per cent.	
Coal, bituminous, round and run-of-mine, and coal not specified, per ton.....	53c.	35c.	
Plus ad valorem.....	7½ per cent.	5 per cent.	
Gibraltar—Coal.....	Free		
Argentina—Coal.....	Valuation per 1000 Kilos 7.00	Rate of Duty Free	
Bolivia—Coal.....	Per Kilo 0.07	Free	
Brazil—Coal.....		Free	
Chile—Coal, not specified, and coke.....		Free	
Colombia—Coal.....		Free	
Ecuador—Coal.....		Free	
Paraguay—Coal.....	Valuation Pesos per 1000 Kilos 11.00	Rate of Duty Free	
Peru—Coal.....		Free	
Uruguay—Coal.....	Valuation Pesos per 1000 Kilos 10.00	Rate of Duty 6 Per Cent.	
Venezuela—Coal.....		Free	
Costa Rica—Coal.....		Free	
Guatemala—Coal except pulverized coal, gross weight.....		0.014	
Honduras—Coal.....		Free	
Nicaragua—Coal.....		Free	
Panama—Articles not specified.....		Free	
Salvador—Coal.....		Free	
Finland—Coal.....		Free	
Denmark—(Crown, 26.8c.) coal, per 100 kilos.....		0.03 crowns	
Holland—Coal.....		Free	
Switzerland—Coal.....		Free	
Greece—Coal.....		Free	
Turkey—Coal.....		Two (2) Piastres per 100 kilos	
Bahamas—Coal.....		Free	
Barbadoes—Coal and coke, per ton.....		2s. 6d.	
Bermuda—Coal, per ton.....		2s.	
British Honduras—Coal.....		Ad Valorem 15 per cent.	
Trinidad and Tobago—Coal, coke and patent fuel		Free	
Jamaica—Coal, coke and patent fuel.....		Free	
British Guiana—Coal, bituminous.....	Per Ton General \$0.50	Per Ton British Preferential \$0.40	
Other.....	.50	.50	
Coke and patent fuel.....	.50	.50	
Newfoundland and Labrador—Coal, anthracite imported through St. John's port.....	.70		
Coal imported through any other port.....	.50		
Dutch Guiana—Coal.....	Free		
Dutch West Indies—Coal.....	Free		
Dutch East Indies—Coal and coke.....	Free		
St. Pierre and Miquelon—Coal.....	Per 100 Kilos, Francs		
Anthracite.....	Free		
Guadeloupe—Coal.....	0.10		
Martinique—Coal.....	Free		
Mexico—Coal.....	Free		
Haiti—Coal.....	\$1.30 per 500 kilos or 1000 lb.		
Cuba—Coal.....	Free		
Virgin Islands—Coal.....	Free		
Dominican Republic—Coal and screenings of coal (gross weight) 1000 kilos.....	\$0.25		
Coke (gross weight) 1000 kilos.....	.75		
Fuel charcoal.....	5.00		
Briquets of coal dust, screenings of coal waste, prepared for fuel, with or without the addition of other substances and other fuels (gross weight) 1000 kilos.....	3.00		

COAL AND COKE NEWS

EDITED BY ALEX. MOSS

Harrisburg, Penn.

Governor Sproul, who last week asked Attorney General Schaeffer to inquire into the power of the state to make an investigation of the proposed increases in the price of anthracite coal, on Mar. 19 indicated in correspondence made public between himself and a representative of independent operators, that an investigation by a legislative commission might be the most effective way to reach a decision as to whether the raise in price is justified.

The Governor also threw out the suggestion to the operators that if a way could be found to prevent, or even to defer, the proposed increase in coal prices until such an investigation has been made as will show that such an increase is justified, if it can be justified, a great deal will have been accomplished.

It is possible, it is said about the capitol, that an investigation might be averted.

Francis S. Brown, former Attorney General of the state, sees no way out for the coal operators except that they be allowed to charge the higher prices announced in their summer schedules. He pointed out that the high wages paid the mine workers, the increased transportation charges, and the fact that so little coal had been purchased this winter, had placed the coal men in a bad situation.

Coal operators who lease properties from the Girard estate have asked the Board of City Trusts of Philadelphia, which handles this estate, to relieve them of a certain portion of the royalties now paid under the increased price resulting from the higher wages. The matter is being placed before the court with a recommendation that the operators' appeal is a righteous one.

When the government raised the miners' wages a dollar, this was automatically added to the price per ton charged by the operator. In accordance with the terms of the Girard lease, the royalty increases proportionately with the gain in price, so that the operator was being taxed for the wage advance, on which he says he did not get any return. The operators ask that the royalty tax on this one dollar be taken off, as they cannot otherwise produce their coal without a loss.

Uniontown, Penn.

The Fayette County coal region continued to mark time during the past week, with but little change in the local situation over that of the preceding week. Approximately 500 additional coke ovens, widely scattered, were blown out in the region, and operation at plants still running averaged four days a week with additional employment given many workers at improvements and repairs being made at plants in order to put the operations into good shape for the prosperous run believed to be due in the immediate future.

The coal market continues to show signs of resuscitation. During the past two weeks there have been a number of inquiries concerning contracts, and the increased number in which these inquiries are being received is believed to be convincing proof that storage supplies have been depleted and that users will have to place orders immediately to keep their plants in operation. There is no storage supply in the region, and this means that when the contracts are signed work will be resumed immediately. Another encouraging development of the week was the receipt of some highly important inquiries from South American industrial concerns. A few cargoes of Fayette County coal have been shipped south during the past few months and there are indications now that some of the operators are to find a ready market in the South American field for their product.

Early stimulation of the coke industry is expected now following the announcement in Washington this week of agreement upon basic prices for steel commodities with basic pig iron at \$25.75 a ton. This indicates that the price of coke will be around \$4.70 a ton if the ratio of 5.5 to 1, effective during the war between the price of pig iron and coke, is maintained.

Operators generally throughout the region seem inclined to go along under the 5.5 to 1 ratio, but they point out that under present conditions they would be unable to supply coke at a profit at a price lower than \$4.70. A number of contracts for the first quarter are about to expire and renewals were held up pending decision of the conference with the Industrial Board of the Department of Commerce and the iron and steel representatives, although in some instances arrangements were made to continue shipments on a month to month basis.

Announcement by Judge E. H. Gary, head of the iron and steel institute, that there was no intention at the present to interfere with the wage scales is reassuring to the region and the feeling of optimism which has been so manifest in the Fayette County field during the period of readjustment continues at high tide.

Charleston, W. Va.

The most encouraging development in West Virginia coal fields was the resumption of work at one or two large operations in the state on Mar. 17, after a suspension lasting over a considerable period. Otherwise conditions as a whole were unchanged in the mining industry of the state. There did not appear to be, during the second week of March, either any decrease in production or any appreciable increase, except in one district. That production is no longer on the toboggan was looked upon as being a favorable sign, but producers up until the last week or so had looked forward to a better market in the West, only to find after careful inquiry that little might be looked for in that respect for the time being.

The general resumption of coal traffic on the lakes is not expected as early this year as in years past. Naturally this will have an effect on other consuming areas, since the resumption of activity in the lake trade was considered reasonably certain of stimulating activity throughout the West. Since Western business has not been increased those districts whose products are usually consumed in that part of the country are working only about one-quarter of the time.

Generally speaking there is more activity in the East than in the West, if the direction of the bulk of the coal produced is to be taken as an index to conditions. However, the Pocahontas district has derived some business from Western sources, and it has helped to stimulate the production and sale of coal in that field to a considerable extent. Car shortages existing in several producing districts are attributed to the fact that the railroads have been under instructions to use only the larger capacity coal cars. This order, however, was rescinded on Mar. 16, at least as to some districts.

The export situation has proved to be discouraging to some West Virginia producers so far as vessels and rates are concerned.

Spokane, Wash.

"This year the coal mines of the Northwest will not operate 40 per cent. of the time, which means a heavy expense for the operators and a shortage of coal," states James S. Ramage, head of the Continental Fuel Co. and the Hawkeye Fuel Co.

For some time there has been serious over-production of coal in the Canadian and other districts from which Spokane and nearby cities receive their supply. About 80 per cent. of the steam coal used in this district comes from the mines of Canada, and a serious situation has developed in that country as evidenced by the recent report issued by the workmen's compensation commission in the definite statement that cost of labor in producing coal is \$2.60 a ton, which is above previous calculations and more than in other field with which Canadian mines compete.

It has been estimated from time to time in a general and unscientific manner that the labor cost of producing domestic coal was from \$1.60 to \$1.80 per ton. The coal industry in the province of Alberta is not on a very sound footing, and the outlook

is far from reassuring. The reason for the high labor cost is that the industry is seasonal. The work is carried on not more than six months during the year and in some parts less. It seems that there are too many mines operating in the province. There are sufficient mines open and sufficient machinery to produce five times as much coal as will be mined this year. Last year 70 mines closed and 71 new ones were opened. The opening of new mines made the problem more difficult. With one-half of the mines in operation working a greater part of the season the situation would be much improved. It is difficult for the Government to prevent the opening of new mines, but unless something is done of that nature the coal industry of Canada will be in serious danger.

The state legislature effectively defeated the "coal bill" by forgetting it on second reading. The "coal bill" No. 204 provided that no municipal, county or state or other public office or institution should use other than Washington fuel. It was defeated when it first made its appearance but was resurrected the last week of the session for reconsideration.

Victoria, B. C.

"By bringing the coal-mining companies under the alternative of income tax or mineral tax, in common with other mining companies, we can hope for a revenue of \$200,000 instead of the \$160,000 estimated for the last year."

This statement was made by the Hon. John Hart, Minister of Finance in the British Columbia Government, when making his budget speech before the Provincial Legislature recently. It is of special interest to the coal operators of the Province as it intimates the policy on which the Government has determined relative to the taxation of the coal-mining industry. From the sense of the statement it is concluded that the report that a straight increase was to be made in the tax per ton of coal produced is without foundation.

In explanation it may be said that the tax the companies now pay is 10c. a ton. Returns of coal produced are made to the Government at regular intervals accompanied by taxation payments on the basis shown. Under the amendment which the budget speech of the Minister of Finance suggests, it is understood that this rate will stand, the companies paying as heretofore, but if at the end of the year it is found that tax on a company's income would realize more to the Treasury than has the 10c. a ton, the company will be required to pay the difference. In other words, the company will be taxed on whatever basis is found to bring in the greater amount to the public exchequer.

It must be understood that there is no definite assurance as yet that this is the Government's policy, because the bill amending the taxation act is not before the House up to the time of writing; but it is the only interpretation that can be placed on Mr. Hart's budget speech, and operators are satisfied that nothing further will be done this year. As far as can be gathered there is no particular objection to the proposal, though there would have been to any suggestion that the tax on the per-ton production be raised. The argument brought against such a move is that British Columbia coal to a large extent comes into competition with that of the Province of Alberta, and the coal of the latter Province is taxed only 5c. a ton.

PENNSYLVANIA

Anthracite

Minooka—The Carlton Coal Co. breaker was totally destroyed by fire on Mar. 19. The loss will exceed \$50,000. The origin of the blaze still remains unknown. The structure was burned to the ground.

Pottsville—State Mine Inspector M. J. Brennan, of the nineteenth anthracite district, in his annual report to the state department of mines shows that last year influenza was far more deadly to mine workers than all the dangers of the mines. There were only 17 men killed in his district during 1918, but the Philadelphia &

Reading Coal and Iron Co., operating in the district, lost 118 men from the influenza. Pine Hill colliery lost 48, and Oak Hill 42. The Buck Run collieries lost 12 per cent. of its men from influenza and Parkwater colliery lost 14 per cent.

Scranton—Fire the night of Mar. 16 caused the destruction of the Minooka breaker of the Carlton Coal Co. It was one of the few electrically equipped breakers in this part of the anthracite field, and the loss is estimated at \$50,000. Several hundred employees were thrown out of work. It is believed that crossed electric wires started the blaze.

Browndale—J. G. Westcott, of Endicott, N. Y., C. H. Truesdale and E. A. Wendell have purchased the Clinton Falls colliery. The purchase of the colliery includes a plot of ground containing 130 acres of coal land. The new owners are to take immediate possession. The machinery and the breaker on the tract have been leased to the company.

Jeddo—Returning to his home in New York, after an inspection of the G. B. Markle Co. properties, John Markle, president of the firm, announced that he will abandon his palatial summer residence and take out the rich beds of anthracite which underlie the premises, covering approximately 18 acres. The estate is one of the beauty spots of the Markle interests, and during the war was turned over to the miners and their families for the planting of gardens. The coal at this point forms one of the richest beds in the entire hard coal fields.

Reading—Engineers who completed an inspection of the Schuylkill Navigation Co. canal on Mar. 18 announced that there will be little or no coal boating on the stream between Port Clinton and Philadelphia next summer on account of the channel being filled with an unusual amount of coal dirt. The recent 7-ft. rise in the Schuylkill River, the largest of the winter, caused thousands of tons of coal dirt to be washed into the canal below Reading. It is explained that it would take an immense amount of dredging to clear the channel, and the navigation company does not seem inclined to go to the expense at this time.

Tamaqua—On Mar. 25 the Lehigh Coal and Navigation Co. put in operation its new No. 11 breaker in the Panther Creek. The breaker is of all-steel construction and is the finest and most modern in the southern anthracite fields. Heretofore it was necessary to send the product from the No. 11 workings to Hauto to be prepared for market, but the new structure will turn out the finished product ready for shipment, proving a great economy. The new breaker will have a capacity larger than the present supply calls for, as it is designed for future contingencies, when the output will be increased by the opening of additional workings.

BITUMINOUS

Canonsburg—A new tippie is to be erected at the Bridgeville mine, and a movement is on foot to organize a Boy Scout patrol.

Shenandoah—The Newly formed Raven Run Coal Co. has awarded a contract for a stripping at its colliery near here. A burning culm bank at this colliery has been successfully cut and the fire is under control.

Clymer—The Widdowson Coal Co. is constructing a new incline plane and storage bin just above its present tippie and will eliminate the long tram haul which it has had heretofore. The coal is loaded from the storage bin into the incline plane cars, which are of the large drop bottom monitor type car.

WEST VIRGINIA

MaeCorkle—Under the direction of Samuel Butler, of Charleston, general manager, the Malleable Coal Co. is preparing to operate an additional mine which it is now opening at this place. The company is also erecting an up-to-date, well equipped tippie and intends to build two miles of standard-gage railroad.

Boomer—The No. 2 North mine of the Boomer Coal and Coke Co. broke all its previous records on Mar. 12 with an output of 1115 tons of coal. J. R. Huddy is the superintendent and C. E. Lilly the foreman. The company has been operating its mines on half time for a few weeks, but expects full-time operation in the near future.

Algonquin—The Algonquin Coal Co. has recently completed 20 new dwellings for the use of its employees.

Matoaka—The American Coal Co. has completed the tippie at the Piedmont mines, which will be used for dumping coal in cars provided by the Virginian R.R. The tippie tracks have not been laid as yet, having been held up on account of the war. It is expected the work will be commenced at once. When completed this mine will be able to load coal for shipment via both the New York & Western and Virginian railroads.

Matoaka—Representatives of the Consolidated Coal Co. were in this field looking over the properties of the American Coal Co. and subsidiary companies, with a view to purchasing. It is reported no agreement could be reached on price.

ILLINOIS

Niantic—Officers of the Niantic Coal Co. have under consideration the sinking of a shaft to a 7-ft. seam of coal which is believed to lie about 500 ft. beneath the surface. Coal is at present being mined from a 5-ft. seam at a depth of 365 feet.

Carlville—Sixty-six men were employed the day the Berry mine operated. This is the first of the three new coal mines which the Standard Oil Co. is opening. More men will be taken on from time to time, and eventually 500 or more will be given work.

West Frankfort—It is said that many of the English and Italian miners in this vicinity are preparing to go back to Europe. The reasons assigned are the lack of work around the mines. Many of the Italian miners made such large wages during the war period that they can live at their ease in the villages of Italy for the rest of their lives.

Collinsville—At the Seventh subdistrict miners' convention here it was reported that there are now 65 cooperative stores in Illinois, organized by the miners. They are under the direction of the Central States Cooperative Society.

KENTUCKY

Whitesburg—The Wells-Elkhorn Coal Co., Beaver Creek, Ky., has purchased the plants and business of the Elkhorn-Black Diamond Coal Co. and the Salt Lick Coal Co., and has acquired additional holdings also—making this one of the largest in the new field. The capital of the company has been largely increased and some large extensions are planned for the immediate future.

Sargent—The Whitley Elkhorn Coal Co. has completed the installation of its power equipment, and plans some extensions and increases at once. Adam Q. Ramey is the electrical engineer.

Personals

H. A. Anderson has been promoted to the position of mine foreman for the Algonquin Coal Co., Algonquin, W. Va.

J. J. Maloney has been employed as a sales representative for the Goodman Manufacturing Co., of Pittsburgh, Penn., in the central Pennsylvania field.

Tom Cunningham has been engaged as mine foreman for the Pawama Coal and Coke Co., Matoaka, W. Va., vice J. W. Shewsbury, who has resigned to engage in other work at Roanoke, Va.

Joseph A. Graft, civil and mining engineer, has opened an office at 507 First National Bank Building, Connellsville, Penn. Mr. Graft until recently was superintendent of the Elkhorn Piney Mining Co., at Riley, W. Va.

F. W. Nay, well known among Kentucky coal operators of Clarksville, W. Va., where for years he was connected with the Elkhorn Coal Corporation, has been transferred to Wayland, Ky., in the right Beaver Creek field of Kentucky.

G. M. Mathews, formerly manager of the Amburgy Coal Co., Smoot Creek, Ky., has accepted a position as superintendent of the Elkhorn Coal Corporation, Garrett, Ky., in the Beaver Creek field of Kentucky. He has entered upon his duties.

Roy Shirley, formerly coal inspector for the United States Fuel Administration in central Pennsylvania, has accepted a position with the Hulburt Oil and Grease Co.,

Inc., of Philadelphia. Mr. Shirley will make his headquarters in Punxsutawney, Penn.

Capt. A. C. Nell, construction division, United States Army, who for the period of the war has been in charge of the purchase of power and mechanical equipment in the construction division, has been released from active duty in the army and has been appointed Chicago district manager for the Lea-Courtenay Co. and the Schulte & Koerting Co. Mr. Nell was formerly connected with the Allis-Chalmers Manufacturing Co. The Chicago offices are at 1466 Conway Bldg.

Obituary

E. W. Bates, who has held the controlling interest in the Latham Mining Co., Lincoln, Ill., died Mar. 15 at Miami, Fla.

O. D. Maxwell, assistant superintendent of mines at Glace Bay, N. S., died Mar. 17 from heart failure. He was 50 years of age and had been an official of the coal company for 18 years.

Charles J. Wittenberg, president of the Wittenberg Coal Co., of New York City, died Wednesday, Mar. 19, in his fifty-fourth year. He was also president of the Newport News Docks and Coal Corporation, the Pocahontas and New River Coal Co., the Victoria Coal Mining Co., and the Virginia and Tidewater Coal Co.

John Patterson, mine foreman of the Klondike mine at Lilly, Penn., was killed recently when an unloaded mine car broke loose from a trip and ran down a grade, catching Mr. Patterson between the runaway car and a standing loaded car. He was fatally crushed and died on his way to the hospital. He was aged 50, and leaves a family.

John R. Williams, member of the once prominent bituminous company of Frank Williams & Co., now for some years out of business, died at his home in Buffalo on Mar. 18, at the age of 64 years. Since the dissolution of the company he had continued business in his own name, though quite out of health for some time. He was single. Three brothers, not in the coal business, and two sisters survive.

Coming Meetings

Illinois Mining Institute will hold its annual meeting May 22, 23 and 24. Secretary, Martin Bolt, Springfield, Ill.

National Coal Association will meet May 21, 22 and 23, at Congress Hotel, Chicago, Ill. Secretary, J. D. A. Morrow, Washington, D. C.

International Railway Fuel Association will hold its annual meeting May 19-22 at the Hotel Sherman, Chicago, Ill. Secretary, J. G. Crawford, Chicago, Ill.

Indiana Retail Coal Merchants' Association will hold its annual spring meeting Apr. 23 and 24 at Indianapolis, Ind. Secretary, R. R. Yeagley, Indianapolis, Ind.

National Foreign Trade Council will hold its sixth convention at the Congress Hotel, Chicago, Ill., April 24-26. Secretary, O. K. Davis, 1 Hanover Square, New York City.

Canadian Retail Coal Association will hold its fifteenth annual convention Apr. 2 and 3 at the King Edward Hotel, Toronto, Canada. Secretary, B. A. Caspell, Brantford, Canada.

Recent Coal and Coke Patents

Ash Sifter. W. J. Kennedy, Binghamton, N. Y., 1,289,187. Dec. 31, 1918. Filed Oct. 28, 1916. Serial No. 128,352.

Furnace Arch. W. D. Ranney, Columbus, Ohio, 1,289,262. Dec. 31, 1918. Filed Jan. 29, 1918. Serial No. 214,323.

Coal Bag. H. Josephson, Bridgeport, Conn., 1,291,539. Jan. 14, 1919. Filed Mar. 6, 1918. Serial No. 220,727.

Coal Car Cover. D. M. Grear, Chicago, Ill., 1,291,481. Jan. 14, 1919. Filed Aug. 8, 1918. Serial No. 248,929.

Ash Sifter. F. W. Seeman, Detroit, Mich., 1,291,190. Jan. 14, 1919. Filed Nov. 18, 1915. Serial No. 62,094.

Mine Car Wheel and Axle. T. A. Parker, Brazil, Ind., 1,289,249. Dec. 31, 1918. Filed Apr. 30, 1918. Serial No. 231,638.

Smoke Washer. G. W. Glassford, Cleveland, Ohio, 1,289,439. Dec. 31, 1918. Filed June 2, 1917. Serial No. 172,514.

Smoke Washer. R. J. Johnson, Lake Benton, Minn., 1,289,797. Dec. 31, 1918. Filed Mar. 1, 1918. Serial No. 219,929.

Ash-Sifting Apparatus. C. M. Drinkwater, Kokomo, Ind., 1,290,725. Jan. 7, 1919. Filed Dec. 20, 1917. Serial No. 208,047.

Coke Oven. R. S. Moss, Chicago, Ill., and A. Roberts, Evanston, Ill., 1,289,870. Dec. 31, 1918. Filed Jan. 7, 1914. Serial No. 810,809.

Apparatus for Cleaning Coal. H. R. Conklin, Joplin, Mo., 1,290,515. Jan. 7, 1919. Filed Dec. 27, 1917. Serial No. 209,101.

Attaching Device for Miner's Cap Lamp. J. M. Brock, Brooklyn, N. Y., 1,289,631. Dec. 31, 1918. Filed June 19, 1918. Serial No. 240,870.

Mining Machine. N. D. Levin, assignor to Jeffrey Manufacturing Co., Columbus, Ohio, 1,290,022. Dec. 31, 1918. Filed Aug. 7, 1913. Serial No. 783,564.

Coal Mining Machine. N. D. Levin, assignor to Jeffrey Manufacturing Company, Columbus, Ohio, 1,290,593. Jan. 7, 1919. Filed Jan. 5, 1917. Serial No. 140,750.

Coal-Loading Shovel. W. Ferris, S. Bager and M. L. Fykse, assignors to Bucyrus Co., S. Milwaukee, Wis., 1,289,426. Dec. 31, 1918. Filed Apr. 28, 1917. Serial No. 165,215.

Publications Received

Methods of Shutting off Water in Oil and Gas Wells. By F. B. Tough. Bulletin 163, Petroleum Technology 46. Illustrated, 122 pp., 5½ x 9 inches.

Biennial Report of the State of Nevada State Inspector of Mines, 1917-1918. A. J. Stinson, State Mine Inspector. Unillustrated, 97 pp., 6 x 9 inches.

Twentieth Annual Report of the Mining Industry of Idaho for the year 1918. Robert N. Bell, State Mine Inspector. Illustrated; pp. 133; 6 x 9 inches.

Abstracts of Current Decisions on Mines and Mining Reported from May to September, 1918. By J. W. Thompson, Department of the Interior, Bureau of Mines. Unillustrated, 138 pp., 6 x 9 inches.

Mines Producing Low-Sulphur Coal in the Central District. By Gilbert H. Cady. State of Illinois Department of Registration and Education, Division of the State Geological Survey. Cooperative Mining Series, Bulletin 23. Unillustrated, pp. 14, 6 x 9 inches.

The Quigley Powdered Fuel System. Quigley Furnace Specialties Co., Inc., New York, N. Y. Bulletin No. 11. Pp. 16, 8 x 11 in., illustrated. A system for preparing, transporting and burning powdered coal, lignite and peat that is the result of twenty years specializing in selection and application of fuels, and in furnace design, construction and operation.

Water-Gas Operating Methods with Central District Bituminous Coals as Generator Fuel. A Summary of Experiments on a Commercial Scale: a Preliminary Report. By W. A. Dunkley, State Geological Survey Division and W. W. Odell, U. S. Bureau of Mines. State of Illinois Department of Registration and Education, Division of the State Geological Survey. Cooperative Mining Series. Bulletin 24. Unillustrated, pp. 28, 6 x 9 inches.

Trade Catalogs

Leyner Oil Furnace No. 3. Ingersoll-Rand Co., New York, N. Y. Form No. 9120. Pp. 4, 6 x 9 in., illustrated. Catalog describing furnace used for heating drill steel.

United Hoists. United Iron Works Co., Kansas City, Mo. Catalog H-19. Pp. 76, 10½ x 6½ in., illustrated. Specifications of belt-driven, steam-driven electric-driven and horse and hand operated hoists.

Specifications of the Mancha Storage Battery Locomotive. Mancha Storage Battery Locomotive Co., St. Louis, Mo. Catalog. Pp. 4, 9 x 11 in., illustrated. Describes in detail the company's well-known types of haulage locomotives.

Fairmont Steel Tie. Fairmont Mining Machinery Co., Fairmont, W. Va. Pamphlet. Pp. 4, 6 x 9 in., illustrated. Gives the construction details of a steel mine tie that is being used in every coal-producing state in the Union.

Sullivan Small, Belt Driven Air Compressors. Sullivan Machinery Co., Chicago, Ill. Bulletin 75-G. Pp. 12, 6x9 in., illustrated. Compressors described range from 50 to 470 cu. ft. in capacity. Simplicity, compactness, power, economy, a minimum of care and attention are claimed.

High-Tension Outdoor Universal "Unit Type" Bus Bar and Wiring Supports. Delta Star Electric Co., Chicago, Ill. Bulletin No. 34. Pp. 48, 8 x 10½ in., illustrated. Gives the design, adjustable features, prices and other details of bus bar and wiring supports for outdoor substations.

"Howells" Non-Corrosive Center Spads. Howells Mining Drill Co., Plymouth, Penn. Booklet. Pp. 6, 3½ x 5½ in., illustrated. Descriptive of mining engineer and surveyor's center spads made of copper, brass and galvanized sheet steel. Two pages are devoted to one of the Howells heavy geared post drill.

Perforated Metals. Hendrick Manufacturing Co., Carbondale, Penn. Catalog. Pp. 128, 6½ x 9½ in., illustrated. A beautifully printed book descriptive of this manufacturer's product, which includes perforated metals, elevator buckets (plain and perforated), conveyor trough and flights, stacks, tanks, hoppers, elevator casings and light structural steel work.

Automatic Reclosing Circuit Breakers. Automatic Reclosing Circuit Breaker Co., Columbus, Ohio. Bulletin No. 301. Pp. 4, 8½ x 11 in., illustrated. Describes the company's new type ARL, DRL and CRL breakers. These are automatic in operation and are governed by an index which responds only when load conditions are proper. The index is adjustable to suit any load condition.

No. 7 Deister-Overstrom Diagonal Deck Coal Washing Table. Deister Concentrator Co., Fort Wayne, Ind. Bulletin No. 2. Pp. 4, 9½ x 11½ in., illustrated. Among the advantages claimed for this process of washing bituminous coal are: Removes sulphur, reduces loss of combustible in ash, increases heating value, increases boiler efficiency, decreases transportation difficulties, makes marketable product from low-grade coal or screenings.

Catalog No. 17. Ohio Brass Co., Mansfield, Ohio. Pp. 671, 6½ x 9½ in., illustrated. A comprehensive publication, carefully indexed and divided into department classifications for ready reference. Should be on the desk of any purchasing agent interested in appliances used in mine haulage systems and transmission lines. Among the specialties listed are high tension porcelain insulators, overhead materials, rail bonds and car equipment.

Industrial News

Ashland, Ky.—The Lackey Mining Co. has increased its capital stock from \$12,000 to \$25,000.

Mossy Bottom, Ky.—The Kentucky Block Fuel Co. has increased its capital stock from \$100,000 to \$200,000.

Akron, Ohio.—The authorized capital of the Akron-Virginia Coal Co. has been increased from \$10,000 to \$250,000.

Ashland, Ky.—The Sandy & Guyan Coal Co., capital \$20,000, has been incorporated by H. C. Rogers, V. I. Jones, O. D. Jones, and others.

Indianapolis, Ind.—The J. R. Morris Coal Co. has filed notice of an increase in its

capitalization from \$30,000 to \$60,000, to provide for expansion.

Richmond, Ky.—The Savage-Smith Lumber and Coal Co., Richmond, capital \$20,000, has been incorporated by Earl Savage, William Smith and D. C. Field.

Cincinnati, Ohio.—The Kellicka Coal Co. has been chartered with a capital of \$100,000 by Edward F. Peters, Frank E. Burnett, S. Geismar, S. R. Ducker and J. G. De Fossett.

Seranton, Penn.—The Echo Coal Co. has been incorporated with a capital of \$50,000 to engage in general coal-mining operations. E. A. Gallagher is the principal incorporator.

Ebensburg, Penn.—The Cambria Fuel Co. has been incorporated with a capital of \$100,000 to operate in the Ebensburg district. A. W. Evans and associates are the incorporators.

Cleveland, Ohio.—The Lake and Rail Coal Co. has been chartered with a capital of \$10,000 by Edwin Robbins Smead, Marie O. Smead, Alice I. Lane, Rudolph Krause and Henry Grund.

Sullivan, Ind.—The Black Comet Coal Mining Co. has filed notice with the Secretary of State of an increase in its capitalization from \$100,000 to \$135,000, to provide for expansion.

Lock Haven, Penn.—The Lock Haven Mining Co. has filed articles of incorporation with a capital of \$100,000, to operate in the Lock Haven section. C. F. Kreamer is the principal incorporator.

Knoxville, Tenn.—The Calvin Holmes Coal Co., has recently filed notice with the Secretary of State of an increase in its capitalization from \$100,000 to \$150,000, to provide for general business expansion.

Morgantown, W. Va.—The Adams Coal Co. has filed articles of incorporation with a capital of \$25,000 to engage in coal-mining operations in the Morgantown district. John A. Adams is the principal incorporator.

Ashland, Ky.—The Sandy & Guyan Coal Co. has been incorporated with a capital of \$20,000 to engage in general coal-mining operations in the Ashland section. V. I. and O. D. Jones and H. C. Rogers are the incorporators.

Cincinnati, Ohio.—The Kellicka Coal Co. has been organized by local financial interests, with a capital stock of \$100,000, being a reorganization of the old Kellicka Coal Mining and Sales Co., operating in Harlan County, Kentucky. L. E. Armen-

Lexington, Ky.—The Vesper Coal Mining Co. has opened offices in Dallas, Texas, with J. K. Bowring as agent in charge of their Texas business. This company owns leases on a large area of west Texas coal lands which it is planned to develop at an early date.

Petros, Tenn.—The State Board of Control, Nashville, John S. Denton, chairman, is arranging plans for the immediate reconstruction of the tippie at its Brushy Mountain coal-mining properties recently destroyed by fire with loss estimated at \$10,000.

Pittsburgh, Penn.—The Consumers' Fuel Co. has contracted with the Roberts & Schaefer Co., of Chicago, for the installation of a picking table in connection with its tippie at the Eureka mine. The new equipment will be installed within the next sixty days.

San Angelo, Tex.—The West Texas Coal Mining and Developing Co. is arranging plans for the early development of approximately 585 acres of coal properties. Mining machinery for all details of production will be installed. J. W. Powell, Ballinger, Tex., is president.

Jellico, Tenn.—The Italian Coal Co., recently incorporated with a capital of \$50,000 to operate in the Jellico district, has arranged plans for the development of a tract of about 5000 acres of coal properties. It is understood that work will be inaugurated at an early date.

Evansville, Ind.—The Evansville Atomized Fuel Co. has been incorporated with a capital of \$250,000 to manufacture atomized fuel in Vanderburg County. Fred Amann, John J. Tuite, William E. Tuite, Thomas Lavelle and Norman Patrick, Indianapolis, are the incorporators.

Jellico, Tenn.—The Italian Coal Co., recently incorporated with a capital of \$50,000, has plans for development of 5000 acres of coal land, but has not completed plans relative to production and time for starting development. C. O. Baird, E. S. Miller and Z. D. Baird are the principals.

Whitesburg, Ky.—The Wells-Elkhorn Coal Co. has increased its capital stock from \$75,000 to \$300,000, after leasing about 1500 acres of coal land in the Jack's Creek section. The company has its office at Left Beaver Creek. A new town will probably be built at the site of the proposed mine.

Whiteside, Tenn.—The New Etna Coal and Lumber Co. has been organized by J. C. Higdon, president; Van Eastland, secretary, and others, to develop a 200-ton daily production. The company will also handle lumber, ties and forest products. Company is capitalized at \$30,000 and has equipped mines.

Phoenix, Ariz.—The Olmos Coal Mining Co. of Phoenix, Ariz., has been granted a permit to do business in Texas, employing a capital stock of \$400,000. Texas headquarters will be maintained at Eagle Pass, and the company will develop extensive holdings of coal lands in the border country of Texas.

Whiteside, Tenn.—The New Etna Coal and Lumber Co., recently incorporated with a capital of \$30,000, has perfected its organization and is arranging plans for the development of local properties, to have a daily capacity of about 200 tons for initial operations. J. C. Higdon is president, V. Eastland is secretary.

Whitesburg, Ky.—The Wells-Elkhorn Coal Co., a new corporation at Left Beaver Creek, north of Whitesburg, has increased its capital from \$75,000 to \$300,000, after leasing 1500 acres of coal lands in the Jack's Creek section. The company plans big developments and a new mining town when conditions are right.

Washington, D. C.—In a tentative decision rendered by the attorney examiner of the Interstate Commerce Commission, joint rates on coal from Illinois and Indiana mines, allowing a charge to St. Louis of 20c. higher than that to East St. Louis, due to river transportation across the Mississippi River, have been upheld.

Gadsden, Ala.—The Blount Mountain Coal and Iron Co. has filed articles of incorporation, capital stock being named as \$2000. J. J. Burns, of Chicago, is president of the company and D. E. Mitchell, of Gadsden, is the local agent of the corporation. It is understood that the company has about 30,000 acres of coal land under option.

Dayton, Ohio—The Robert H. Ball Coal Co., recently chartered with a capital of \$150,000, will soon start development of a large area in the Hazard field of Kentucky. It is also announced by Robert Ball, president, that the concern will build a large coal elevator in its retail yard in the east side of Dayton at a cost of approximately \$20,000.

Seranton, Penn.—H. McKean Conner, consulting mining engineer, has received the drawings for a complete coal mining plant to be built in South Brazil, the expected output to be 1000 tons in eight hours. The shaft is 131 meters deep. The equipment, which has all been bought in the United States, is up to date in every particular.

Radford, Va.—The Belle Hampton Coal Co., recently incorporated, has completed negotiations for the purchase of the Belle Hampton coal properties, and it is understood that plans are now in process of formation for the commencement of development at an early date. It is said that the plans include the construction of necessary railroad facilities.

Chicago, Ill.—The first concrete coal car ever constructed was recently delivered to the Illinois Central R. R. for operation in the company's coal service. The patentee and designer is Joseph B. Strauss, civil engineer and president of the Strauss Bascule Bridge Co. The car has a capacity of 100,000 lb. and was built by the Conway Co., a Chicago concern.

Columbus, Ohio—The Flint Coal Co. has been chartered with a capital of \$40,000 to operate a coal mine near McArthur. The mine has been opened and is loading some coal. It is planned to increase the output. William Dauch, of Delphos, Ohio,

is president; W. C. Fridley, Lima, vice president, and L. F. Bertram, Columbus, secretary, treasurer and general manager.

Chicago, Ill.—The W. A. Jones Foundry and Machine Co., manufacturer of a complete line of power transmission apparatus, special foundry and machine work and also the Jones spur gear speed Reducer, has opened an eastern office at 30 Church St., New York, under the direction of Lemuel C. Biglow, who formerly for a number of years held a similar position with the Morse Chain Co., of Ithaca, N. Y.

New York, N. Y.—The St. George Coal Co. is the name of a new corporation with offices in the Singer Building, 149 Broadway, this city. G. B. St. George is the president and L. V. Birmingham is vice-president. Mr. Birmingham was formerly a salesman for Whitney & Kemmerer. This company will handle Philadelphia & Reading; Delaware, Lackawanna & Western and Lehigh Valley Coal Co.'s coals.

Clarksburg, W. Va.—One of the new and larger corporations of the state organized within the last few days insofar as securing a charter was concerned, is the Orr Coal Co., with a capital of \$100,000, the company being interested in the operation of several large plants in northern West Virginia. Leading figures in the new company are Harry W. Sheets, J. W. Agnew, C. S. Elliott, C. E. Prunty and J. W. Booth, all of Clarksburg.

Chicago, Ill.—The Sullivan Machinery Co. announces the appointment of Chester Mott as manager of its branch office at Denver, Colo., 837 Equitable Building, succeeding Wallace T. Roberts, recently resigned. Mr. Mott has been associated with the company for several years past in the capacity of sales engineer at its Spokane, Wash., office and more recently at its Chicago office in charge of the company's interests in Iowa, Northern Illinois and Minnesota.

Dallas, Tex.—The Garrison Coal and Oil Co. is being organized here for the purpose of developing a tract of 500 acres of land underlain with lignite. This tract of land is near Garrison, Texas, and is also considered as promising for oil development. The company is capitalized at \$500,000 and the officers are: Sterling P. Strong, of Dallas, president; T. R. McLean, of Mount Pleasant; L. E. Birdsong, of Greenville; J. R. Slay, of Frost; R. W. Caraway, of Logansport, La.; and W. Y. Garrison, of Garrison, directors.

Benton, Ill.—The Dodds Coal Co., with a paid-up capital of \$25,000, has been incorporated by the Illinois secretary of state. It has its principal office at Carrier Mills, Saline County, Illinois. The company has secured a large tract of land just south-east of Carrier Mills for prospecting. The Big Four R.R. has a switch leading to the mine. The vein of coal is said to be large and the quality unsurpassed. Coal has been lifted during the past few months from the air shaft, but the main shaft is to be completed within a few weeks.

Charleston, W. Va.—Under the terms of a bill introduced in the Senate of the West Virginia legislature, now in extraordinary session, by Senator E. H. Morton, of Webster Springs, no company, firm or person shall operate a mine after June 1, 1919, unless a license shall have first been secured; and to secure such a license application would have to be made to the auditor of the state, together with a written statement swearing to the production of each mine of the applicant.

Charleston, W. Va.—In all 33 lives were lost during the month of February in West Virginia mines, 21 fatalities alone being due to falls of coal, slate, roof, etc. The next largest number of casualties—seven—was due to mine-car accidents. Only two deaths were caused by motor accidents. The only other fatality within the mines was caused by an electrical shock. There were, however, two deaths on the outside of the mines, one due to electricity and the other resulting from a motor-car accident. Of the total number of 33 fatalities, 11 were in McDowell County.

Columbus, Ohio—President Henry A. Williams and Secretary James T. Daniels, of the Columbus Chamber of Commerce, have suggested a central route for the proposed barge canal to connect the Ohio River with Lake Erie. In the authority secured from Congress for a survey the route from Cincinnati to Toledo by way of the Miami canal is expressly mentioned, but authority is given for the survey of

"other practicable routes." Now it is proposed to have the route from Columbus to Sandusky via the Scioto River to Marion and the Sandusky River from Upper Sandusky to Sandusky surveyed also.

Danville, Ill.—The Illinois Traction System has been ordered by the Council of Danville, Ill., to cease hauling coal through the streets between the hours of 6 a.m. and midnight. During the period of the war the demand for coal became so urgent and the difficulties of transportation so great that the Councils of Danville, Champaign, Urbana and other cities modified their pre-war ruling that no interurban trains of coal could be moved through the streets between the hours of 6 a.m. and midnight. The Danville Council now demands that coal cars be transported through the streets of the city only during the latter part of the night, that is from midnight to 6 a.m.

Gary, Ind.—About 5000 tons of coal, originally purchased by the Aetna Explosive Works for the purpose of making munitions, have been purchased by the Gary board of education. James F. Cullerton, purchasing agent of the school system, bought the coal through the Empire Trust Co., receivers for the Aetna company. The coal was the property of the French Government, which made its purchases through the Aetna company. Mr. Cullerton purchased 2000 tons at \$1 a ton and learning that 3000 tons were still in the bunkers, telegraphed an offer and it was immediately accepted. Mr. Cullerton made a large saving for the board of education, the supply of coal being enough to last the Gary schools one year.

Louisville, Ky.—Further warnings on the part of western Kentucky mine workers to some of the operators who are cutting coal prices, on who are threatening to make reductions, have been sent out by unions representing the men. Serious conditions are said to be impending unless the workers are heeded. The latest ultimatum is from District Union No. 23, United Mine Workers of America, with headquarters in Kentucky and is addressed to western Kentucky operators in general. The miners claim that the only meaning of reduced prices is reduced wages. The ultimatum recites that the coal miners need more than a mere living, in fact a profit on their work, and emphasizes the fact that the coal miner has done a large part in the industrial background of the recent world war.

Baltimore, Md.—The annual meeting of stockholders of the Consolidation Coal Co. held here recently brought with it the retirement from its presidency of Jere M. Wheelwright, who will, however, take up the work incident to the post of chairman of the board of directors. Former Senator Clarence Watson, who has been chairman of the board, became president of the company. New vice-presidents named are Sprigg D. Camden, of Parkersburg, W. Va.; F. W. Wilshire, of New York; and E. M. Mancourt, of Detroit. Arthur Hale was reelected vice president. George T. Watson and Fairfax S. Landstreet are named as assistants to the president. New directors on the board are Gen. Carl R. Gray, Brooks Fleming, Jr., and George T. Watson. The net tonnage of the Consolidation mines in 1918 was 8,053,010, as against 9,533,543 tons the year previous. The net earnings of \$26,148,895 showed only a decrease of \$35,691, but the net earnings of \$7,155,169, because of labor and other operating increases in cost, showed a falling off of \$4,181,791.

St. Louis, Mo.—Following the submission of a tentative report to the Interstate Commerce Commission by Commissioner Mackley upholding the Terminal Railway Association's bridge arbitrary of 20c. a ton on coal, bills have been introduced in the Legislature authorizing the city to create and operate its own terminals. It is planned to establish such terminals in competition with the Terminal Railway Association if the Interstate Commerce Commission upholds Mackley's report. It is the intention to use the municipal free bridge, city terminal property and the Manufacturers' Ry. It is also contemplated to appeal the case to the Federal Court, if the decision of the Commission is adverse to the city. The appeal will be in the form of contempt proceedings against the railroads in the Terminal combine to compel them to show cause why they treat the Terminal as a separate road and allow it a separate rate for carrying coal and other freight across the river to St. Louis and performing a delivery function which the roads themselves should perform.

MARKET DEPARTMENT

EDITED BY ALEX MOSS

Weekly Review

Labor's Attitude When Peace Is Signed Now Chief Topic of Discussion—Now Is Best Time to Purchase Fuel—Consumer Shares Blame in Present Coal Situation—Anthracite Industry Dull—Contract Inquiry Brisk

UPPERMOST in the minds of the thinking element in the bituminous coal industry is the question of what turn events will take when the present wage agreement expires, which will be when the treaty of peace is signed. To say that the mine workers are restive is to put it mildly. The men are dissatisfied with their present earnings and with their hours of work, and have already gone on record as demanding a six-hour workday for only five days a week and an increase in the daily rate. This would net them more return for the reduced working time than they receive for a full 48-hour week under the present agreement.

These demands, in the main, are the result of the reduced working time at the mines, though one cannot overlook the fact that they are also a reflex of the attitude now being taken by British mine labor. The tremendous cut in coal consumption in this country immediately following the signing of the armistice led to the shutting down of a large number of operations and the curtailment of working time at many others. The story has been told so often that it has become almost a platitude.

What the large consumer of coal does not realize, however—and what he will be the first to deny—is that he himself cannot escape blame for the present situation. He kept out of the market

for so long a period that his disinterestedness has shaped itself into a boomerang that has turned the corner and will shortly strike him in his most vulnerable spot—his pocketbook. For, if the miners' demands are satisfied, it will mean an increase of more than 60 per cent. in the earnings of mine workers who are paid by the day. Other classes of labor will doubtless want increases, and all in all the cost of producing bituminous coal will be much higher. This certainly is pathetic, as the chief reason that prompted most consumers to hold off in their buying was that prices must certainly come down.

Once the situation is viewed in its true light, apathetic purchasing agents will awaken to the fact that the time to buy coal and make contracts for their future requirements is right now. The Federal Fuel Administration has already seen the handwriting on the wall, and is urging consumers to buy soft coal early. This is not another unfounded cry of "Wolf! Wolf!" but is based on the production figures of weekly coal output. During the week ended Mar. 31 the output of bituminous coal was 8,065,000 net tons. At this rate the production at the end of the present coal year will not exceed that of the previous coal year by more than 8,000,000 net tons.

The anthracite situation is exceedingly dull. What the labor attitude

will be when peace is signed it is hard to foretell, as the workers in the hard-coal region have a contract that does not expire until 1920. However, we have heard references made somewhere to "scraps of paper." Agreements and treaties in these momentous days seem to carry with them no particular significance.

A reduction recently made in the price of rice and barley may help to stimulate interest in these two steam sizes of anthracite. Dealers are not stocking up to any extent, believing that it would be wiser instead to dispose of the stocks on hand. Production is picking up somewhat, the output of hard coal during the week ended Mar. 15 being estimated at 1,206,000 net tons. The total production for the coal year to Mar. 15 is 89,317,000 net tons, as compared with 95,370,000 net tons during the same period of the previous year.

Contract activity in the bituminous industry is brisk, though operators are loath to bind themselves at this time as they do not know what the labor situation will be two months from now. Prices are being maintained, the better grade coals finding ready takers at former Government figures. Low-grade coals are hard to move. Conditions in the bituminous trade are improving, though many operations are still working short time due to "no market."

WEEKLY COAL PRODUCTION

The production of bituminous coal during the past few weeks has varied but very little, and the current week's output, estimated at 8,065,000 net tons, is no doubt a fair barometer of bituminous coal demand. As during recent weeks, the current week's output fell approximately 3,000,000 net tons below the production for the same week of 1918, bringing the excess in the output for the coal year to date over the same period of last year down to 13,670,000 net tons, and it is estimated that the close of the coal year on Mar. 31 will find the excess at not more than 8,000,000 net tons, and the actual output at approximately 558,000,000 net tons for the year. The daily average per working day during the week ended Mar. 15 is estimated at 1,344,000 net tons, as against 1,806,000 net tons for this coal year to date, and 1,760,000 net tons for that period of the 1918 coal year ending with Mar. 16.

Production of anthracite in the United States during the week ended Mar. 15, estimated at 1,206,000 net tons, was approximately 20 per cent. in excess of production during the week ended Mar. 8, estimated at 989,000 net tons. Compared with the production during the week ended Mar. 16, 1918, when the output was 2,099,000 net tons, the current week's production was exceedingly low. The daily average per working day during the week

ended Mar. 15, is estimated at 201,000 net tons, as against 298,000 net tons for the coal year to date, and 318,000 net tons for the same period ended Mar. 16, 1918. Total production for the period Apr. 1, 1918, to Mar. 15, 1919, is estimated at 82,317,000 net tons, as compared with 95,370,000 net tons during the same period of last year.

Carriers' reports for the week ended Mar. 15 show but few changes in loading in the various fields, compared with the week for Mar. 8. Slight decreases occurred in Pennsylvania, Tennessee and Kentucky, and in the central states, while slight improvement was reported in all other fields. For the calendar year to date, loading in all the fields is considerably behind that of last year.

The mines of the country have been operated during the past four weeks at approximately 50 per cent. of their full time, with time losses due to labor and car shortage, mine disability and lack of market, fluctuating but very little from week to week. The real limiting factor is, of course, lack of demand, and unless the "buy early" campaign, inaugurated by the United States Fuel Administration during the past week, is taken seriously by the consumers of the country, very little improvement may be expected in the full-time operation of the mines until the stocks accumulated last summer and fall are more generally used up.

Tidewater shipments to New England during the week ended Mar. 15, are estimated at 57,710 net tons, and are 48.2 per cent. behind shipments during the week of Mar. 8. No tonnage was loaded at Baltimore for New England, while the tonnage loaded at New York and Philadelphia, amounting to 34,156 tons, fell 47 per cent. behind the loading of the week preceding, and Hampton Roads tonnage of 53,554 net tons fell 49 per cent. behind. Rail shipments during the week to New England were not reported.

Shipments of bituminous coal from North Atlantic ports and Hampton Roads to all points, during the week ended Mar. 15, are estimated at 321,064 net tons, and are 29.4 per cent. behind shipments during the week preceding. Baltimore, with a loading of 35,069 net tons, was the lone harbor to report improvements, the current week's shipments exceeding that of the preceding week by 57.7 per cent. Shipments from New York and Philadelphia during the week of Mar. 15, fell 48.1 per cent., and from Hampton Roads 19.4 per cent.

Beehive-coke production in the United States during the week ended Mar. 15 is estimated at 429,446 net tons, as against 441,031 net tons during the week of Mar. 8, and 604,516 net tons during the corresponding week of last year. The daily average per working day during the current week is estimated at 71,574 net tons.

and while slightly in excess of the daily average for the calendar year to date, estimated at 70,402 net tons, is considerably below the daily average for the same period of 1918, estimated at 79,312 net tons. Production during the current week in Pennsylvania, Virginia, Kentucky and the far west states fell below that of the week of Mar. 8, while considerable improvement occurred in West Virginia, Alabama, Tennessee and Georgia. Compared with the week of Mar. 15, 1918, the current week's production in all states is exceedingly low.

BUSINESS OPINIONS

Bradstreet's—Trade and industrial developments of the week have been many and varied, these including a further expansion in spring trade at most markets, especially in dry goods and wearing apparel, hitherto inclined to lag a trifle behind other lines; a speeding up of industrial operations where readjustments have been completed and new demand has appeared; a glowing series of reports as to early crop and soil conditions in surplus crop regions; a rather sharp advance in many food products, with a consequent advance in the general level of necessities; excellent returns as to general export trade for February, and enlarged shipments of wheat to Europe.

Marshall Field & Co.—Current wholesale distribution of drygoods is running considerably less than for the same week of 1918. Road sales for both immediate and future delivery also were much less than the high figures of a year ago, although first fall orders for lines which have just been opened are larger in comparison with those of last year. More customers were in the market. Collections continue satisfactory.

Dry Goods Economist—In the great agricultural region west of Chicago retailers are doing a large business. Naturally, in the industrial centers where there has been cessation of Government work, or labor unrest, retailing has been on a somewhat less free scale. Such conditions, however, are the exception. For Southern retailers there has been encouragement in the renewed upward movement of cotton.

American Wool and Cotton Reporter—The feeling in the wool market is improving generally. Demand is, however, a little spotty. Some days the demand is marked and some days it is not so pronounced. China wools are of interest for woolen purposes, and fine wools are also in demand. There is some talk of the United States Government following the ideas of the British government in reducing the price levels. Dealers are naturally laying their plans for purchases of the next clip, and they do not want to make them at the present level, if the Government is going to reduce prices. Tendencies in the cotton market are bullish. Predictions are made in many quarters that raw cotton will sell at materially higher prices before a new crop is marketed.

The Iron Age—Among the leading producers of steel there has been no change in the feeling that price reductions at this time will not produce the desired revival in buying. Reductions in copper, more drastic than have been proposed in steel, have not stimulated demand, it is argued; and the spelter market, with the price below the cost of well-equipped producers, has no semblance of life. The amount of steel bridge and building work put under contract in February was practically no greater than that in January. The total of the two months is 44,000 tons out of a year's capacity of 2,160,000 tons. In the winter of 1914-1915, before the war demand from Europe set in and when the fabricated steel business saw the lowest demand for years, the January-February total was about 95,000 tons, more than twice this year's.

Atlantic Seaboard

BOSTON

Another pause in buying. Many contracts made for small tonnages. No comprehensive buying as yet. Quotations firm. Few consumers can take April or May coal. Diffident about contracting. Wide range in price continues. Hampton Roads freights approach stable figure. June is the earliest date set for buying Southern coals. Distress offerings at New York piers. Anthracite quiet. Railroad-owned barges tied up generally. Effort made to induce retail buying, but demand extremely light. Steam sizes in short supply.

Bituminous—For the first time since the market began to improve a month or so ago there is now an interval of very few purchases. It is not due to any slackening in interest, nor can it be regarded in any sense as a sign of weakness; it simply means that those who were ready to buy have done so, and that others have postponed entering the market. There is bound to be a dull period between now and a month or two hence when it is expected there will be renewed inquiry and on a larger scale. Those who can take in during the summer what is practically a season's supply are still waiting to test the market, and this attitude will be justified so long as operators make spot prices less than their contract offerings. The crux of the matter is, however, that there are few large consumers in position today to receive shipments in such volume as would be of help to producers who are struggling to hold their men at the mines.

While the number of contracts already placed is large, and the aggregate tonnage considerable, it should be stated that most of them are for less than 10,000 tons and that with few exceptions they are on grades that have come to be regarded as specialties. Nothing else would account for the prices consumers have agreed to pay. And it is also true that by far the greater number of these contract arrangements have been made in the same channels as in other years. Service during 1917 and 1918 has frequently been a consideration in favoring customary sources of supply, but now most of this smaller business has been taken care of and there remains the broad competitive market the trade is hoping for later in the season.

Several charters have been made from Hampton Roads to Boston at \$2, but there is only light demand even at that figure. The trade regards this as about the right level for barge transportation, although on steamers it is felt that when several of the 5000 to 8000-ton ships are returned by the Shipping Board to their owners, there will be a rate nearer \$1.50@1.75. It is expected that by June 1 Hampton Roads rates will have become stabilized and that the smokeless agencies will be in that much better position to make delivered prices.

No one here looks for any active market on Pocahontas and New River until well into June and July. Of course a considerable volume of business has already been underwritten by factors who are themselves producers, but this is all on a mine basis plus charges. Inland from Providence and Boston buyers are more likely to wait for a definite figure on cars; otherwise they will turn to all-rail shippers. It seems to be clearly established that a large number of buyers who have been accustomed to Southern coals will pay a dollar or more over the cost of all but the very choicest grades from Pennsylvania.

One of the demoralizing features of the present situation is the volume of distress coal available at the New York piers. This is being sold at from 50c. to 75c. less than any \$2.95 price at the mines would warrant and the few orders that were in the market for April shipment have been filled from that source. With small barges plentiful at \$1.35 from New York to Boston it is easy to see that this coal would be readily absorbed by consumers who had the room to take it. Buyers find it hard to understand why prices should be held so firmly at the mines while sacrifices are being made at the loading ports.

Bituminous prices at wholesale are about as follows, f.o.b. mines and at loading ports, per gross or net ton as designated:

	Clearfields	Cambrias and Somersets
F.o.b. mines, net tons....	\$2.15@2.75	\$2.80@3.50
Philadelphia, gross tons....	4.20@4.90	5.00@5.55
New York, gross tons....	4.50@5.25	5.35@5.95
Alongside Boston (water coal), gross tons.....	6.10@6.85	6.90@7.80

Georges Creek is quoted at \$3.20 f.o.b. mines per net ton.

Pocahontas and New River are unchanged at \$4.70@5.25 f.o.b. Norfolk and Newport News, Va., for spot coal, the former Governmental differential of 35c. in favor of New River being fairly well maintained. Alongside Boston the present gross ton range would be \$7.15@8.10.

Anthracite—Demand remains extremely quiet, the kind of market that usually precedes a 50c. reduction in price. While retail dealers along the coast have no expectations of lower prices on coal they are certainly withholding orders until something definite is announced with regard to barge rates. Only in scattered instances, however, are all-rail dealers filing their or-

ders for April shipment. A 10c. advance is certain for May 1, and yet there is no buying in any direction worth talking about. In any other year this lack of interest would be something remarkable.

A large fleet of railroad-owned barges and tugs is tied up at New York because the authorities have not yet seen fit to fix lower rates. Outside barges are in ample supply at \$1 to ports on Long Island Sound and at \$1.25@1.35 to Boston. The few cargoes of domestic sizes now coming forward are being freighted in these boats and the trade is eagerly waiting for some sign from Washington that railroad barges will resume their usual functions in the anthracite business. Meanwhile the piers at Philadelphia and New York are embargoed from further receipts because of accumulation, and collieries are forced to shut down three and four days a week.

NEW YORK

Reduction in prices for rice and barley announced by one of the large companies. Harbor strike ties up shipments and supplies are running short. Public service corporations are feeling effects of labor trouble. Line dealers taking coal and active market expected. Policy of education may help summer buying. Bituminous situation shows slow but steady improvement. Dumpings of anthracite and bituminous increase.

Anthracite—The announcement of one of the large producers of a 15c. reduction in the prices for rice and barley was by far the best information received by the trade the past week. A cut in the mine prices for the anthracite steam sizes has been hinted at for some time as the only way of holding the present trade and also as a means of regaining some of the trade lost to soft coal operators because of the lower prices at which bituminous could be obtained. With the cut in rice and barley prices the present rates at the mines are \$2.75 for rice and \$2.25 for barley. There was no cut made in buckwheat.

There is a good demand for the steam coals which enables the companies to maintain prices and put a premium on some grades of the so-called independent product, especially the better grades. Stocks are not plentiful because of the curtailed production, but there is enough to keep everybody supplied with current requirements.

Movement of the domestic coals, as well as of the smaller sizes, has been slow because of the harbor strike now in its fourth week. Very little coal has left the docks, but this has not as yet inconvenienced the local retail dealers to any great extent, most of whom had full bins when the difficulty first started. Their bins are now beginning to look rather bare, but no serious consequences are looked for so long as weather conditions remain seasonable.

Most Brooklyn and Long Island dealers have been kept supplied with coal because of all-rail deliveries. The office buildings in lower Manhattan are not having any difficulty in keeping their fires going, most of this fuel being ferried across the river from the New Jersey piers.

Some houses report fairly active buying inland with good prospects for the late spring and summer. It is expected that considerable coal will be sent into the west, many inquiries having been received from that section of the country.

Current quotations, white ash, per gross ton, at the mine and f.o.b. tidewater at the lower ports are as follows:

	Mine	Company Circular
Broken.....	\$5.95	\$7.80
Egg.....	5.85	7.70
Stove.....	6.10	7.95
Chestnut.....	6.20	8.05
Pea.....	4.80	6.55
Buckwheat.....	3.40	5.15
Rice.....	2.75	4.50
Barley.....	2.25	4.00

Bituminous—The slow but steady improvement continues. Operators say that inquiries are more numerous and that the prospects of a good contract closing are encouraging. In some instances it is said the operators are inclined to hold back, they not being disposed to tie up the major part of their output.

The marine strike is playing havoc with consumers, not many of whom can boast of large stocks at present. With the trouble entering upon its fourth week and the settlement apparently as far off as at any time, the outlook is dubious for many industrial plants that secure their coal by water. Already many large consumers are canvassing the situation and making arrangements, if it is possible, to secure sufficient coal to meet their current needs.

Shipping has also been interfered with and many bottoms have been sent to other ports because of the difficulty to obtain

fuel here. In many instances transatlantic liners have been detained for a couple of days while waiting for sufficient coal to take them to Europe. This has caused a considerable loss of tonnage to local dealers.

There is an increasing call for coal along the line, but in small lots, the tendency apparently being to prevent having large stocks on hand as the heated season opens. There is also a feeling that buying can be done at lower prices as the season advances, but operators ridicule that idea in the face of the present cost of mining.

The poorer grades of coal are not being inquired about, buyers wanting nothing but the high-grade coals. While the appended price list gives the average range of quotations, some lower quotations have been heard of for various grades of coal:

Quotations in various grades of bituminous coal for spot delivery and contract follow:

	Spot	Contract
South Forks.....	\$2.90 to \$3.50	\$2.95 to \$3.50
Cambria County		
(good grades)....	2.80 to 3.10	2.95 to 3.10
Clearfield County		
(good grades)....	2.65 to 2.95	2.80 to 2.95
Reynoldsville....	2.65 to 2.95	2.85 to 3.00
Quemahoning....	2.85 to 3.10	2.95 to 3.10
Somerset County		
(best grades)....	2.80 to 2.95	2.95 to 3.10
Somerset County		
(poorer grades)....	2.50 to 2.75	2.75 to 2.95
Western Maryland.	2.50 to 2.75	2.65 to 2.85
Fairmont.....	2.10 to 2.35	2.35 to 2.50
Latrobe.....	2.25 to 2.40	
Greensburg....	2.35 to 2.40	2.35 to 2.60
Westmoreland 1-in.	2.60 to 2.75	2.65 to 2.75
Westmoreland run-		
of-mine.....	2.40 to 2.65	2.40 to 2.65

PHILADELPHIA

Improvement in anthracite situation checked by state price inquiry. Consumers withhold orders expecting lower prices. Retail price cutting minimized. Pea size hangs heavily on shippers. Stove and nut in most demand. Contracting on steam sizes. Bituminous quiet. Prices well maintained, with light production. Contracting increases. Railroads buying little fuel until April 1.

Anthracite—As the dealers were preparing to go after spring business following the announcement of the summer price schedule, Governor Sproul announced his intention of investigating the reason for the continuation of the winter schedule. The newspapers have given wide publicity to the subject, and this has had quite a distressing effect on business.

Any investigation honestly undertaken will only divulge what every other similar query has shown during the past several years—that the retail price of coal per ton has advanced far less in proportion than most commodities. As a matter of fact it would not be surprising if the investigation should demonstrate that an even higher price is justified.

In the meantime the coal trade has sagged almost completely. Retailers report that many customers who had placed orders for spring delivery have telephoned in suggesting that these be held until later in the season, frankly stating that they feel coal might be lower in price. This seems to be the general impression.

Shippers report that little business is being received without solicitation. Even where dealers have room for a considerable tonnage they are in no hurry to buy, and all seem satisfied they can secure their requirements during April.

There is little price-cutting, what there is of it being confined to the firms who usually indulge in this game. So far as we can learn the principal efforts of the price cutters have been centered on pea coal, which nearly every one has in stock in large volume. The lowest price on this size remains at \$8, and one dealer has cut as low as \$10 on egg.

Pea coal continues to be a burden on the shippers. It was really a surprise when the new prices were announced that some action was not taken to make it more attractive. It is a fact that some shippers have changed their screens and a better size is coming to market, but the price is too near that of chestnut to attract the consumer; as a consequence sales are away below normal for this time of year. Chestnut is beyond all doubt the best seller now, and with stove is causing much less trouble than the other sizes. Owing to the mild winter, egg coal, which usually had quite a spurt late in the season because the early supplies of the householders had become exhausted, has recently been draggy. We hear of some price cutting on it by the smaller houses. This condition will probably not be general after Apr. 1, as we

expect to see egg as well as broken well covered by contract. At this time one of the large operating companies is entering into agreements on broken at \$5.95 at the mines, which is also the present circular on that size, and while egg coal is \$5.85 and will so continue until May 1, will eventually be 40c. higher than broken.

Among the steam coals buckwheat is being sold off by some of the independents, but not in very large lots. All the larger shippers are adhering strictly to the price of \$3.40, as recently announced, and are making contracts on that basis. On the smaller sizes there have been slight price reductions by the companies, amounting to 15c. per ton.

The prices per gross ton f.o.b. cars at mines for line shipment and f.o.b. Port Richmond for tide are as follows.

	Line	Tide		Line	Tide
Broken.....	\$5.95	\$7.80	Buckwheat.....	\$3.40	\$4.45
Egg.....	5.85	7.70	Rice.....	2.75	3.65
Stove.....	6.10	7.95	Boiler.....	2.50	3.50
Nut.....	6.20	8.05	Barley.....	2.25	3.15
Pea.....	4.80	6.40			

Bituminous—The trade continues as it has for the past ten weeks. There is little buying for current use, yet the operators are able to maintain the price range on good coals from \$2.90 to \$3.15. Rather than sell below these figures many operators close down their operations. On special coals, such as blacksmith, prices run from \$3.25 even up to \$3.75, with of course little tonnage moving. There continues to be an increasing contract activity, with prices fixed similar to those quoted above. While some contracts are dated to begin Apr. 1, many do not call for shipments until several months later, even up to June 1. At this time the railroads are not actively in the market for fuel, but there are indications that they will be ready to close agreements by Apr. 1.

BALTIMORE

Prices quoted at mines more even than at tide, where there is an unusually wide range for bituminous coals. New York strike and embargo cuts loose some cheap fuels in this section, and the market is strictly one for buyers and not sellers. Hard coal dealers here to take up retail price question during week.

Bituminous—A tremendous effort is being made by producing concerns and distributors to hold up the market, but the success has been rather indifferent at times. Some high-grade coals, it is true, are being held firm at the old Government maximums or better, but other high-grade coals are selling much off that figure. Some operators have agreed to stand by others in their regions to protect fuels, and then openly admit that some sales have been made below the quotations they give when approached. At tide the sales of coal caught here have gone over one of the widest ranges in years, practically the same grade of coal selling to the trade on a single day at prices ranging from a little over \$2 on up to \$2.75.

The strike in New York harbor has had a distinct effect here. Much coal has been caught away from New York by the embargoes, and has either been shunted into this and other eastern territory or is standing on sidings at the mines or along the railway lines to the coast. This coal in some cases is now offering cheap and hurting what would otherwise be a firmer market.

Another disturbance to the local situation was the release here during the week to the bunker trade for foreign vessels of some 180 cars of coal which the Navy had standing at the Canton pier of the Pennsylvania R.R. since December. Vessels were ordered to take this coal to the exclusion of private shippers. This coal is being fast cleared up, but the Navy has another lot at Curtis Bay and a big storage pile at a water-front ordnance depot; and there is a fear in the coal trade that this, too, will be released.

Anthracite—The hard-coal dealers have taken no steps as yet to fix an April selling price to the public here. The various wholesale schedules are awaited first. The members of the board of the Baltimore Coal Exchange will take up the subject some time this week and will then call a meeting of coal dealers to arrange a schedule of sales. It is probable that the margin of profit as allowed during the war by the Fuel Administration will be followed. This may give a slight cut in the spring and early summer from the existing retail schedule, and possibly a slight advance when the full over-summer 50c. raise in wholesale prices becomes reflected in the retail selling here.

Lake Markets

PITTSBURGH

Production remains very light. Market slightly more ragged. Steel industry's coal consumption may not decrease further.

The coal market is as dull as ever, and is somewhat more ragged. Production remains at 25 to 30 per cent. of capacity, not having improved appreciably, while it still seems to be a shade in excess of actual requirements, so that odd lots of coal are frequently forced on the market at cut prices, below the accepted levels of \$2.35 for mine-run and \$2.60 for 3-in. gas. In the case of demurrage coal sales are sometimes made at under \$2.

Coal consumers are showing the utmost conservatism and evidently will consume practically the last ton of coal in stock piles before making extensive purchases, their theory being that while demand for coal may become much more active it is quite improbable that any demand can develop that would send prices above the present asking levels.

Very little contracting has been done for the twelvemonth and operators are no longer making any effort to close contracts. They realize that the situation will have to work itself out and that the maintenance of prices depends upon regulation of production to requirements.

Coal consumption by the steel industry has decreased further, but the decline in steel mill operations will probably be arrested by the slight price reductions that were made last week under the auspices of the Industrial Board of the Department of Commerce. While these reductions were less than had been expected, they will probably inject a confident feeling in the steel market for a month or two at least.

Apart from occasional sales of odd lots forced on the market, the market is quotable at \$2.25@2.35 for steam mine-run, with 1½-in. domestic at but little more, 3-in. gas coal running \$2.50@2.70 according to grade, all per net ton at mine, Pittsburgh district.

BUFFALO

Trade still slow. Light contracting. All mines going on short time. No promise of a stir. Loading anthracite into lake vessels.

Bituminous—The demand continues light. If there is any increase most of the trade has not observed it. The warm weather has had much to do with the small consumption of coal. Nobody recalls such an open winter. Last year it was May before the lakes were open, this year they have not frozen at all. Jobbers are not receiving many contract inquiries, for consumers still expect a decline in prices.

The price of high-grade bituminous is still at former Government figures, though some low grades are selling at a reduction, with certain members of the trade trying to maintain that these cut prices are the prevailing ones. Quotations: \$4.60 for thin-vein Allegheny Valley; \$4.45 for Pittsburgh and No. 8 lump; \$4.20 for mine-run and slack; \$5.65 for smithing and smokeless; \$5.60 to \$6.10 for cannel; all per net ton, f.o.b. Buffalo.

Anthracite—The situation remains as before. This winter is gone and only the smallest amount of buying will take place till the consumer begins to stock up for next winter. Some demand will arise before the May advance, but nobody knows whether it will be of much account. Shipping agents are overrun with coal that they have had to put into lake vessels in order to escape paying demurrage on it. The outlook is not for a very active season. The Canadian anthracite trade is as quiet as the Buffalo trade, with dealers often carrying wood, coke or bituminous coal which they bought against a possible giving out of anthracite, and which they cannot sell now at any price.

CLEVELAND

Decided improvement is noted in bituminous shipments to northern Ohio, the bulk of the increase going to Lake Erie ports for loading in lake carriers. Steam-coal users are buying more freely. Prospects are that the lake season will open slowly, but wind up just the opposite.

Bituminous—Considerably more snap is being evidenced in the bituminous markets. This is believed to be due principally to the formal presentation of wage and other demands by No. 8 district mine workers, and the consequent fear of a tie-up when peace is actually declared and negotiations be-

between operators and mine workers get under way. Stock piles in many cases are showing bottom now, while quite a volume of business, for some time repressed by high prices, is believed to be on the verge of coming out. The outlook altogether is the best in some weeks. The sight of bituminous destined for lower lake car dumpers is most cheering, too.

The subject of price has come in for considerable consideration lately and many informal discussions are said to have been had by No. 8 district operators. The sentiment is said to be almost unanimous that present prices are too high. Whether a reduction would stimulate business is the question. Some operators have favored reductions ranging from 45 to 25c. off the \$2.60, f.o.b. mine price fixed by the United States Fuel Administration for prepared sizes. There seems to be no question but that when the price of lake coal for the 1919 season is fixed it will be under the 1918 figure. No. 8 district operators are anxious to have the matter of price adjusted as soon as possible in order to get the lake season away swiftly.

Lake Trade—Though quite a number of early cargoes are being floated, the 1919 season on the Great Lakes probably will not be in full swing until the end of the first week of April. The season is expected to open a great deal slower than normal, due to stocks carried over by upper lake docks and the uncertainty of prices. No. 8 operators fear that while the season will open slowly it will wind up with a rush. The No. 8 district, which sent forward 5,249,728 tons to the upper lakes last season, undoubtedly will far exceed that figure this season. Estimates of total bituminous lake shipments in the 1919 season all range around 22,000,000 to 23,000,000 tons, compared with 28,000,000 tons in the 1918 season.

Coal prices, per net ton delivered, are as follows:

Anthracite	
Egg.....	\$10.80@10.95
Chestnut.....	11.00@11.10
Pocahontas	
Lump.....	7.50
Mine-run.....	7.20
Domestic Bituminous	
West Virginia splint.....	7.05@ 7.15
No. 8 Pittsburgh.....	6.15@ 6.35
Massillon lump.....	6.95@ 7.10
Steam Coal	
No. 6 slack.....	4.45@ 4.55
No. 8 slack.....	4.90@ 4.95
Youghiogheny.....	4.95@ 5.05
No. 6 mine-run.....	4.35@ 4.55
No. 8 mine-run.....	4.90
No. 8 1/2 in.....	5.45@ 5.55

DETROIT

Small orders from retailers for domestic lump are said to form a large part of the present business of jobbers, with the steam trade inactive.

Bituminous—Unsatisfactory conditions are encountered by jobbers who attempt to sell bituminous coal in the Detroit market. The volume of business is described as small. A considerable proportion of it is said to be made up of small orders for lump from retail dealers, who desire to supply a household demand without greatly increasing stocks on hand, which in most instances consist of mixed sizes and much coal of inferior quality.

Efforts to interest consumers of steam coal in offerings of high-grade stock formerly popular in the Detroit market are disappointingly unsuccessful, due to the unusually large reserves in storage yards of most of the buyers. Because of the quantity of coal at hand, few of the large steam-coal users manifest any inclination to consider contracts at this time. Their backwardness in this respect, jobbers say, is also the result in part of an idea that coal can be had cheaper by holding off.

Slack is proving especially hard to move. While in comparison with previous years the quantity of slack reaching Detroit is small, there is apparently no present demand. Prices are said to have been reduced on some offerings as much as \$1 below the Fuel Administration level. Mine-run also is not easy to place, and low prices have been quoted by some dealers. On domestic lump and egg sizes, prices are being kept fairly steady around the mark set by the Fuel Administration, jobbers say.

That certain producers are doing more to impair stability of prices than any other factor in the market is asserted by some of the jobbers, who say they have learned of attempts to sell coal at very low prices to consumers, who owing to their heavy reserves indicated no interest in the propositions they received.

Anthracite—Inquiry for anthracite from household consumers was more active during the recent period of cold weather. Retail dealers in most instances were able to supply all requirements for any size of anthracite. There was a broader inquiry also for coke, the supply of which seems fully sufficient for the needs of the market. Dealers say a considerable quantity of domestic coke is now arriving in Detroit.

COLUMBUS

A slight increase in the demand for steam grades has developed in the Ohio coal trade recently. Domestic business is slow and little tonnage is moving. Prices are uncertain, but the larger companies are maintaining Government quotations generally.

In almost every locality there is a little current business to report, but the tonnage moving is not large. Purchasing agents are more disposed than ever before to discuss the question of fuel, but they are still holding off when it comes to signing contracts for any large steam tonnage. A large number of contracts expire around Apr. 1, and there is much uncertainty in the future. It is reported that a large contract has been closed at a reduction of 10c. under the Government figures. There is sufficient spot coal moving to take care of current demands. Reserve stocks are still large and in some instances are sufficient to last from four to six months.

The domestic trade is quiet in the extreme. Retailers are not buying, as their stocks are large. There is some demand for the so-called fancy grades such as Pocahontas and West Virginia splints, but this is not sufficient to cause much activity in the trade. Householders are not stocking up for the future and reports show that a considerable tonnage will be carried over until next season. Dealers in this territory do not expect much trade until later in the summer. Country dealers are preparing for a number of orders during the summer to take care of the threshing demand. On the whole, the retail trade is slow, because of the unusually warm weather that has prevailed and the large stocks. Prices are pretty generally maintained, although some cutting is reported.

CINCINNATI

Contract business is attracting attention, but is not progressing rapidly on account of situation in the market. Current demand remains moderate.

With an improved condition in the general situation, brought about by the advance of the season and the changed attitude of consumers with reference to the fuel supply, attention has naturally been centered more on the status of contracts for the coming year; and a peculiar situation has been noted. While large users of fuel are willing to contract, provided they can secure low prices commensurate with the comparative dullness of the market, producers are not willing or anxious to contract at such prices, as they are by no means sure they can make a satisfactory profit under the uncertain conditions existing in the industry.

Operators openly declare that they prefer to let contracts slide rather than bind themselves to furnish coal for an entire year at rates which might in all probability fail to yield a living margin. This attitude seems to be growing stronger as the season advances, and the impossibility of keeping the coal trade on a starvation basis becomes more apparent. It is not at all unlikely, therefore, that before long the logic of the situation will force a decidedly higher level of prices for contracts to be entered into, and that this in its turn will operate to strengthen the spot market, thus helping things all around. A more optimistic feeling regarding the amount of coal carried over is also in evidence, as it seems that this is not going to interfere materially with purchases for next winter on the part of domestic consumers.

LOUISVILLE

Conditions showing slight improvement and general trade taking on more optimistic air. Steam demand improving somewhat, and numerous inquiries being received on contract prices.

Operators are generally more optimistic concerning the market during the spring and summer months. During the past month inquiries on quotations for annual contracts have been coming in well, and a fair volume of business has been landed. However, operators as a rule are not sure of the labor situation, and are going slow when it comes to quoting prices below the former Fuel Administration maximum price, on contracts. A few operators are cutting prices for immediate business, but standing pat on futures.

The coal trade generally is strongly in favor of the news items appearing in daily papers relative to summer stocking for domestic consumers. It is believed that the remnants of the Fuel Administration can do some excellent work via the publicity route in showing the consumer that prices are firm, stocks being depleted, and that it will be a wise policy to stock during the spring and summer months, especially if the consumer desires the better grades.

Prices are fairly firm, but there is some price cutting being done. One large retailer reported that he had been offered the best eastern Kentucky run-of-mine at \$2 per ton, which is between 20 and 50c. under the market. At this price he purchased some stock, as he figured he could handle it through his own screening plant, screen 65 per cent. lump and come out well at the price.

The market this week per short ton is quoted as follows:

	Eastern Kentucky	Western Kentucky
Block and egg.....	\$2.85@3.00	\$2.60
Run-of-mine.....	2.20@ 2.40	2.35
Nut and slack.....	1.90@ 2.10	2.05

BIRMINGHAM

Consumers of steam coal reluctant to enter market. Domestic grades continue to enjoy a fair demand, though the supply is being curtailed by the dullness in steam trade. Production showing a gradual decline.

The Birmingham coal market is very quiet and steam users as a whole are not taking much coal in the spot market, though there is a good sprinkling of small orders, and inquiries are now being received from contract consumers. It is expected that some improvement will be seen in the trade within the next two weeks. The largest contracts closed so far were for 10,000 and 12,000 tons of railroad fuel at the last named Government figures. Some export business is being gradually developed, 1000 tons of coal from this field being shipped to Cuba through the port of New Orleans the past week, and orders are in hand for several thousand tons more. Bottoms are hard to obtain for export business, shipowners stipulating the tonnage they will handle, which in many cases is in excess of tonnage to be moved. Prices are being rigidly maintained on the basis of last Government schedule, and are as follows per net ton mines:

	Mine-Run Prepared	Slack and Screenings
Big Seam.....	\$2.45 \$2.70	\$2.40
Black Creek and Cahaba.....	3.45 3.75	3.05
Corona, Jagger and Pratt.....	2.85 3.05	2.45

While there is little demand for domestic coal from consumers on account of mild weather conditions, the wholesale trade is fairly good and the output of the mines is readily marketed. Domestic sizes are not any too plentiful, as the output of lump and nut from steam producers is far below normal. Contract buying is expected to begin between now and Apr. 1. Domestic quotations are as follows:

	Lump and Nut
Black Creek and Cahaba.....	\$3.85
Corona.....	3.65
Carbon Hill.....	3.15
Climax and Montevallo.....	5.00

Commercial mines in this field are running from two to five days per week. Furnace companies have curtailed production considerably, the Woodward Iron Co. having closed down practically all its mines, its furnaces being banked, while other large ironmakers have closed down some of their large operations pending a revival in the pig iron trade.

Coke

CONNELLSVILLE

Market prices fairly well maintained. Production relatively low. Reduction in pig iron pleases coke operators.

The reduction of \$4.25 in pig iron prices arranged last week between the Industrial Board of the Department of Commerce and representatives of the merchant pig iron producers, proved to be quite a satisfactory piece of intelligence to the coke producers. The coke producers wanted pig iron to be reduced so that demand for pig iron might be stimulated, whereby more coke would be consumed, while at the same time

they did not want to see pig iron reduced so much that claims would be made for further reductions in coke prices. The pig iron reduction went about as far as it could without furnishing grounds for bringing up the subject of coke prices, except in the case of contracts that had been written at "last Government price," such contracts having been adjusted down only as far as \$5, except in one or two instances, in which no adjustment at all had been made. With coke at \$4, or one-third less than the Government limit, it is in line with basic pig iron at \$25.75, valley, the new price, against the last Government price of \$33.

The furnace coke market is a shade easier than a week ago, but is not quotably lower. Recognized standard brands of furnace coke are still held at \$4, for both prompt and nearby shipment, and this price has been paid freely by furnacemen who wanted fair-sized lots of standard grade. Sometimes the price has been shaded fractionally, while coke of only fair reputation has sold in a few instances at \$3.75. In the case of foundry there is a wide variety of fairly good brands to select from at \$4.50, while two or three old line operators still adhere to \$6. The market is thus quotable at \$4 for furnace and \$4.50@6 for foundry, per net ton at ovens.

The "Courier" reports coke production in the Connellsville and Lower Connellsville region in the week ended Mar. 15 at 202,308 tons, a decrease of 20,618 tons. While the production was lower than in three weeks preceding, it was about the same as production in the week ended Feb. 15.

Buffalo—The demand for coke is light and the outlook for the season is still not well defined. While it is quite certain that about the same amount of iron ore will be moved as in recent seasons, the ore men are waiting for general developments. No lake charters have been reported yet. The lake fleet is not fitting out as it would if good business was expected early, and brisk operations are expected only late in the season. The coke market is dependent on the ore movement and must wait for it. Quotations are \$7.60 for 72-hour Connellsville foundry and \$6.60 for 48-hour furnace. Off-grade is unsteady and hardly quotable.

Middle Western

GENERAL REVIEW

Market continues dull, though inquiries are coming in. Expect that labor troubles will interfere with industry in near future.

The coal market in the Middle West continues to be uniformly dull, and with a general lack of interest expressed on the part of the consuming public. The weather may have something to do with this, as the Middle West territory has been enjoying some nice spring weather for the last week. Inquiries are coming in a little faster than heretofore, but this is only natural, as we are now in the midst of the contract season.

To date the buying public have not shown a very keen interest in placing its coal requirements under contract, and the coal men are a little worried over the attitude the public is taking, as each operator has a clientele of special friends that he does business with year after year that he wishes to protect. The difficulty of the situation is that the average coal men confidently expect some labor troubles a little later on in the season. Whether it will affect his field or fields further east, he is not prepared to say, but he does know that should any important coal-producing district be tied up with a strike, the result would be that prices of coal in the non-affected fields would promptly advance.

The industry as a whole is not as yet on a stable footing. However, we understand that the new prices on steel products will soon be published as a direct outcome of the steel men's conference recently held in Washington. If something like this could be done with the lumber and coal business—especially coal—it would be a great benefit to the trade.

There has been no more price cutting on this market than usual, and in this price-cutting game the small operators appear to be the chief offenders. We think men, who from the standpoint of production are perhaps in the minority, are doing the industry as a whole a considerable amount of harm, and it is to be hoped that some means will be worked out by the National Coal Association to curtail their activities in this respect.

Reports show that manufacturing conditions, taken as a unit, are improving. Factories are working now that were idle

a few weeks ago. The country is getting a little more confidence, but in view of the fact that there is still so much coal in storage, the effect of this confidence has not as yet been felt in the coal industry.

CHICAGO

Steam trade dull, while domestic demand is picking up.

There is absolutely no change in the steam market in this city since last week. Everything continues along dull lines, with no big sales reported. The domestic situation is a little better, as the dealers are now doing some business. It seems that the householders have just about cleaned up their coal bins, and as their furnaces will have to be kept going for at least another six weeks, the dealers are planning on a fair business from now on. There has been some domestic buying, most of it Franklin County or Eastern coal.

Prices per ton are as follows:

ILLINOIS

Southern Illinois Franklin, Saline and Williamson Counties, etc.	F.o.b. Mines	Rate to Chicago
Prepared sizes.....	\$2.55@2.75	\$1.55
Mine-run.....	2.35@ 2.50	1.55
Screenings.....	1.85@ 2.20	1.55
Central Illinois		
Springfield District		
Prepared sizes.....	\$2.55@2.75	1.32
Mine-run.....	2.35	1.32
Screenings.....	2.05	1.32
North in Illinois		
Prepared sizes.....	\$3.25	1.24
Mine-run.....	3.00	1.24
Screenings.....	2.75	1.24

INDIANA

Clinton 4th Vain District		
Prepared sizes.....	\$2.65@2.75	1.27
Mine-run.....	2.35@ 2.45	1.27
Screenings.....	2.05@ 2.25	1.27
Knox County Field		
Prepared sizes.....	\$2.65@2.75	1.37
Mine-run.....	2.35@ 2.45	1.37
Screenings.....	2.05@ 2.25	1.37

MILWAUKEE

The fact that there are no dealers buying keeps soft coal from sagging, despite cutting at the mines. Very little doing.

The coal market at Milwaukee has developed no new features since last week's report. Stocks continue to move off slowly. There is much more soft coal on the docks and in interior retail yards than will be called for by the end of the coal year. But for this fact prices of western grades would have been on the toboggan ere this, as Illinois operators are shading prices in an endeavor to stimulate business. The first dealer who buys at the new rates will let down the bars. Prices of all grades of coal and of coke are firmly held, with everybody in the trade guessing how long it can be maintained. The supply of anthracite is being reinforced by rail, but dealers are looking for an advance in the price of hard coal. The weather continues mild for the season and everything points to an early spring.

Following are the coal prices at Milwaukee, per short ton, effective Mar. 1. The prices given include delivery. At the yards the prices are 50c. per ton less:

Domestic		Short Ton
Anthracite—		
Egg.....		\$12.20
Stove.....		12.40
Nut.....		12.50
Pea.....		11.00
Buckwheat.....		10.60
Bituminous—		
Pocahontas mine-run.....	\$3.15	
Hocking, screened.....	7.90	
Youghiogheny, screened.....	7.90	
Pittsburgh, No. 8, screened.....	7.90	
West Virginia, screened.....	8.40	
Splint, screened.....	8.40	
Kentucky, screened.....	8.40	
Illinois, screened.....	7.25	
Coke—		
Solvay, large sizes.....	\$11.50	
Solvay, small sizes.....	10.25	
Smithing.....	8.40	
Steam—		
Youghiogheny, Hocking and Pittsburgh		
No. 8, screened.....	\$7.18	
No. 8, pile run.....	6.93	
No. 8 screenings.....	6.68	
West Virginia, Kentucky and splint		
Screened.....	7.68	
Pile run.....	7.43	
Screenings.....	7.18	

Illinois and Indiana, screened.....	6.50
Pile run.....	6.25
Screenings.....	6.00
Smithing.....	7.68

ST. LOUIS

Market continues inactive, with promise of better screening conditions. Situation is extremely trying, with no demand at all for any kind or size of coal.

There has been a slight increase in the demand for steam coal from the Standard field in the past few days. At least, it has been noticeable that screenings moved from some mines that have been unable to work on account of a surplus of screenings. There is, however, a noticeable falling off in the demand for lump in the Standard district, for both steam and domestic. This would indicate that the lump coal will be easier and the screening and steam market will become stronger.

Locally there is no demand for either steam or domestic Standard coal. A few plants here and there are getting a few cars in, but it has not affected the market as yet. Some mines are working one and two days a week; others are not working at all. The railroad tonnage the last week increased somewhat. It has been reported that the railroads have been instructed from Washington to let their storage coal remain on the ground and give the miners as much work as possible on new coal.

In the Mt. Olive field similar conditions exist, although most of this coal is moving north, with a little railroad tonnage to help. This market is inclined to be fairly steady and holding to the Government price. Mines in this district are working about two days a week.

In the Cartersville field of Williamson and Franklin County, as well as in the Perry County field, there continues to be an over-production. Steam sizes, such as screenings, have kept many mines shut down on account of their inability to move. At other mines the domestic sizes are piling up. The railroad tonnage from this field is not what was expected, but is moving out on contract principally. These contracts are not profitable. The Missouri Pacific contract at the present time calls for \$2.07½ for mine-run coal.

The operators in the Franklin County field, however, are turning down all cheap prices, and the prices in the Franklin County field are holding up stiffly, while Williamson County is inclined to be a little bit weak; so is Perry County.

Business conditions in general are not good throughout the Mississippi Valley at this time. That is one reason why the steam sizes are heavy. There is no immediate chance of improvement.

The prevailing prices are per net ton f.o.b. mines:

	Mt. Olive and Staunton	Standard
Franklin County Prepared sizes, lump, egg, Nos. 1 and 2 nut.....	\$2.75	
Williamson County		
Prepared sizes, lump, egg, nut.....	\$2.55	\$2.55
Mine-run.....	2.20	2.20
Screenings.....	2.05	2.05
3-in. lump.....	2.30	
2-in. lump.....		1.75@ 1.90

Williamson-Franklin rate to St. Louis is \$1.10; other rates 92½c.

HAMPTON ROADS

The following are the prices of anthracite and bituminous coal at retail per ton of 2000 lb. delivered on the different grades of coal enumerated. These prices hold good until Apr. 1, 1919:

Pennsylvania anthracite.....	\$11.70
Pennsylvania anthracite, half ton.....	6.00
Pocahontas egg.....	8.90
Pocahontas, run-of-mine.....	7.90
Pocahontas lump.....	8.90
Pocahontas nut.....	8.90
Splint.....	8.50

Pocahontas and New River run of mine \$4.85 per net ton on tracks in carloads; for foreign shipment, \$5.40 per gross ton; for coastwise shipment, \$5.10 per gross ton; for bunker purposes, \$5.40 per gross ton, plus expenses of delivery. A war tax on railroad freight charges in addition to all the foregoing prices.

Suppliers are offering Pocahontas and New River run of mine for local industries at \$4.85 per net ton, plus war tax on railroad freight, delivered on track or over piers for the year commencing Apr. 1, 1919.